

THE IRON AGE

New York, Thursday, March 10, 1910.

COMPRESSED AIR AND ITS USES.—II.

Horizontal Excavation.

In vertical pneumatic excavation, maintaining proper air tension is rather simple. Usually it is kept a little stronger than the hydrostatic pressure at that level. Where unknown pressures of water and quicksand are likely to be encountered, trouble may be avoided by making test borings.

midway between the two extremes of hydrostatic head is used. This means an excess pressure on the roof and a deficient one at the bottom. If the overlying soil is inadequate to retain even this lower pressure, a blanket of clay is sometimes dropped over the tunnel. This may be a very expensive although necessary remedy. It is said that the clay blanket for the East River tunnels of the Pennsylvania Railroad cost about \$300,000.

The bottom of the tunnel will be wet because of the insufficient pressure, and, if of sand, may be too soft to support the heavy steel shield used in construction, thus permitting deviations from the grade of the tunnel and breakage of the cast iron lining enveloped by the shield. Broken segments can be easily replaced, but deviations in grade may be difficult to correct; the unwieldy shield must be maneuvered and the tunnel itself redirected, requiring the use of special cast iron lining sections.

The direct effects of gravitation play but little or no part in ver-



Fig. 7.—A Shield Used by the Hudson Companies.

Horizontal pneumatic excavation is very different. It is conducted simultaneously at various levels, so that there is a range of hydrostatic head. The Pennsylvania tunnel diameter of 23 ft. means a difference in hydrostatic head between the top and bottom of 10 lb. per square inch. An air tension adjusted to keep the upper surface dry will not keep the bottom dry, and the tension required by the bottom will be in danger of blowing through the top. So that, if it is porous or loose, such an escape of air would lower the tension and let water and mud rush in. In practice, a pressure about

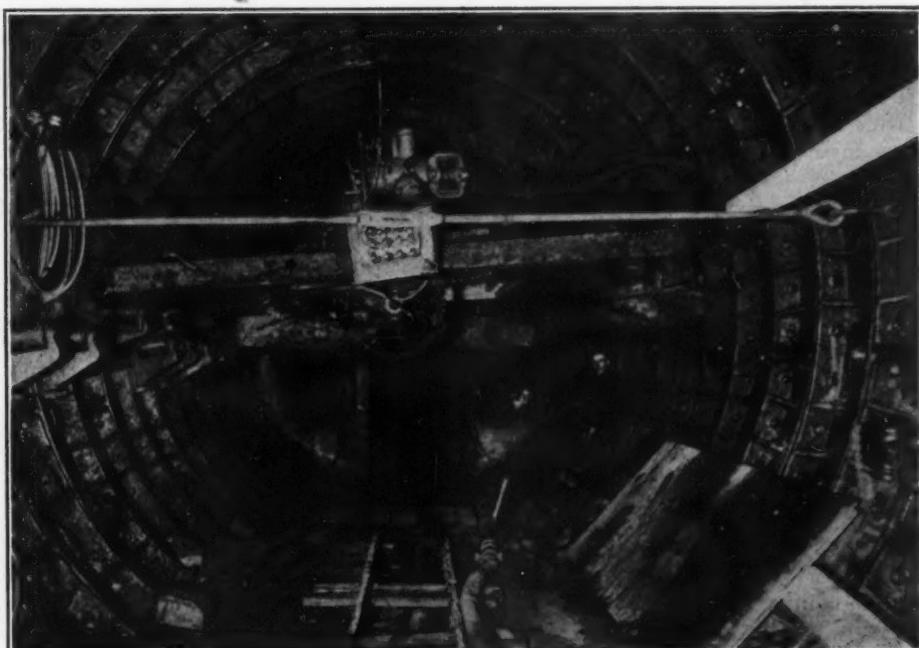


Fig. 8.—A View of a Shield from the Rear or Tunnel Side.

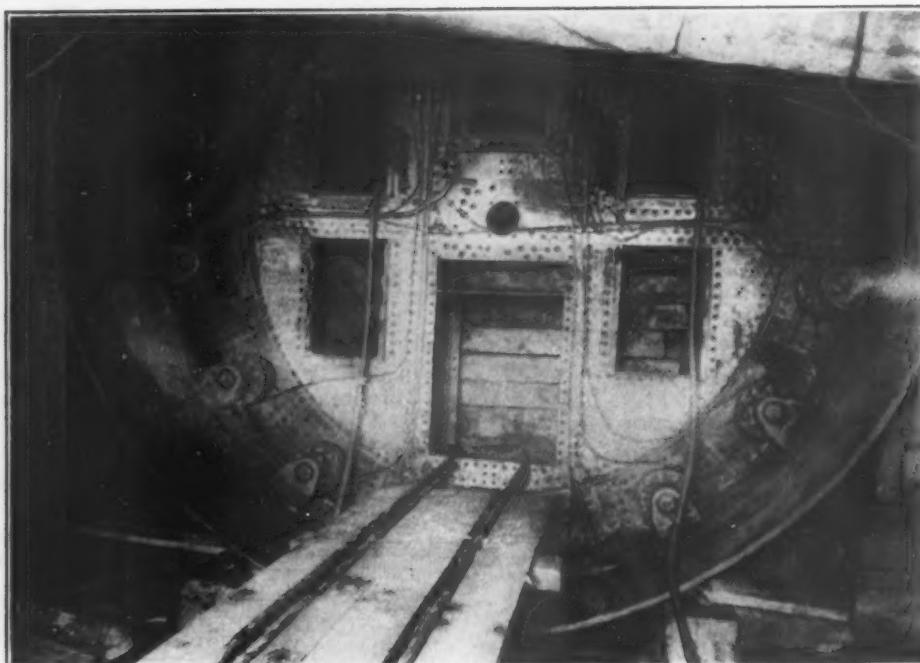


Fig. 9.—A Close View of the Rear of a Shield.

tical excavation. The compressed air, assisted by the skin friction, easily supports the great weight of caisson, air shaft and concrete, and sometimes additional weight is necessary to secure penetration. Penetration to a material which will permit sudden and large escape of the compressed air is very improbable, but both of these may and do occur in tunneling. The solid material in the roof is, no doubt, at times partly supported by the upward pressure of the air, but this is only true to the extent that the material is impenetrable by the air. A porous, thin overlying stratum may be encountered at any time, especially where blasting must be done, an excess of material may be dislodged which will create a cavity at whose top the hydrostatic head is reduced and the protective covering made thinner, and a blowout may occur from either or both of these conditions. In this event, the greater the volume of air to the rear the better, for the pressure will not so soon be lost and with the compressors meantime at top duty, disaster can be averted until the hole is stopped. Then outside material may settle in and close the hole more permanently.

In horizontal penetration through rock and part rock, it is a great problem to blast, excavate and remove the rock so that the different operations do not interfere with each other. The condition where the face of the excavation is rock to a level near the top and where the overlying material needs support upon removal of the rock is one of considerable difficulty. To blast away the rock and still find a means of supporting the roof is the problem.

The New York Tunnels.

The subaqueous tunnel work recently completed or nearing completion in and around New York City constitutes in the aggregate the greatest example of

horizontal pneumatic excavation. The island of Manhattan is entered by only two railroads—the New York, New Haven & Hartford Railroad and the New York Central lines. The Pennsylvania, the Baltimore & Ohio, the Lackawanna, the New Jersey Central, the Erie and other roads have to transfer their passengers by ferry. The tunnel system of the Pennsylvania Railroad which will shortly be put in operation extends from a point on the west in New Jersey about a mile back from the Hudson River, passes under that stream, continues underground across Manhattan Island, dips below the East River and rises to the surface on

the Long Island side. In actual operation are two distinct lines of the subfluvial system of the Hudson Companies. These lines connect with the New Jersey side. In operation also is the subaqueous tunnel line which connects the original New York subway with that of Brooklyn.

As far back as 1873 a company was organized to construct a tunnel beneath the Hudson, and from the very first it was the plan to use compressed air. The walls were to be lined with sheet iron rings, each consisting of a number of sections of $\frac{1}{4}$ -in. plate, $2\frac{1}{2}$ ft. wide, connected by 3-in. angle bars. Such a ring when assembled and braced formed a kind of retaining wall. A brick lining would then be constructed for the $2\frac{1}{2}$ ft., and in much this manner the tunnel progressed. It was at first proposed to construct a double track tunnel, but so much difficulty arose on account of the size of the cross section that it was soon determined to construct a tube for each track. This plan has since been adhered to in all subaqueous work in New York. Following the rather crude method, briefly described, two tubes were pushed out from Fifteenth street, Jersey City, toward the New York shore, one for a dis-



Fig. 10.—A Section of Completed Tunnel Before the Laying of Track.

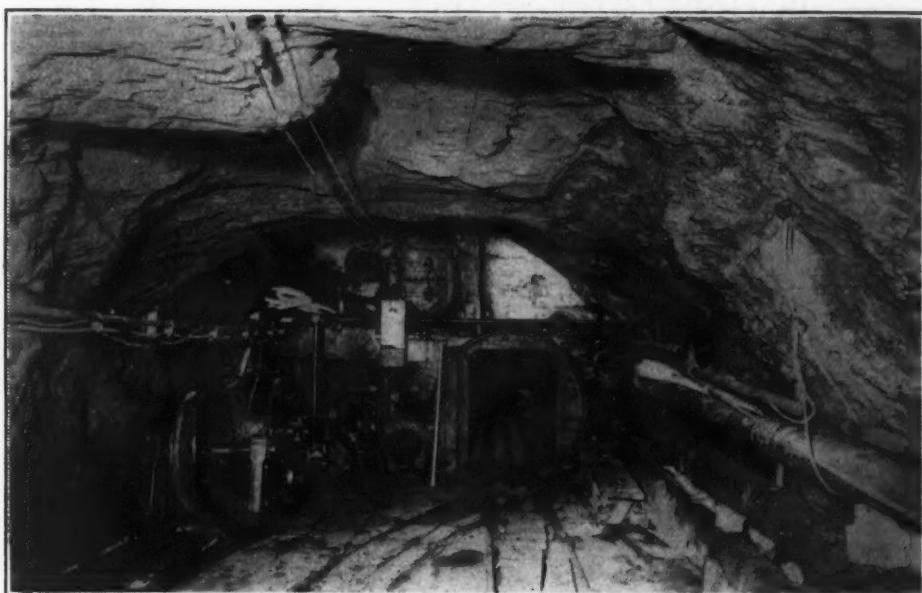


Fig. 11.—One of the Hudson Companies' Systems of Air Locks.

tance of 500 ft., and the other 2000 ft. It is said that it was impossible to maintain alignment or grade. Later on construction was continued by a somewhat different method, using a shield.

The tunneling shield was invented by Brunell in England about 1818. Subsequent use and experience have somewhat modified it, but the fundamental idea has persisted. Essentially the shield consists of a stout cylindrical shell with a strong partition transverse to the axis which may have several openings in it. This structure serves to restrain the surrounding material. A permanent lining of brick or cast iron is constructed from the point of origin to a point well within the shield. If the initial end of this lining is securely supported against a horizontal thrust by arranging jacks to operate from the other end against the shield partition, the shield itself may be given a very powerful thrust forward. Ordinarily, this thrust is not expected to perform actual excavation. The shield is jacked forward to occupy a newly excavated section ahead. This will usually have been dug or blasted out by workmen in advance of the partition. However, the forward rim is called the cutting edge, and in some of the tunnel work beneath the Hudson it was possible to secure penetration by the jacks and without employing men at the head of the shield. If the soil is quite soft, the power available sufficient and the shield itself strong enough, penetration may be made, thus even with the entire partition closed. In other cases where conditions are not so favorable, a portion of the partition may be left open for the ingress of the mud. The shield then advances, "bleeding" its way. The shield may be operated with or without compressed air. The first tunnel under the Thames, London, was driven by the use of the shield and without the employment of pneumatic means. This tunnel was completed in 1843.

that constructional activities centered. The method of the shield was continued. The internal diameter of the iron lining was 18 ft. 2 in. It was expected to use this tube for a double track electric railway, whose rolling stock would necessarily have been on a rather small scale. It was realized, however, when this matter had been fully considered, that this solution of the problem would be inadequate. Accordingly, work was recommenced on the other tube, of which only 570 ft. had been completed. The internal diameter for this work was determined as 15 ft. 3 in. On the New York side the tunnel work was extended eastward to the junction of Ninth street and Sixth avenue, and thence northerly along the latter. On the New Jersey side the old idea of having a terminal between the Lackawanna and Erie depots was abandoned. It was decided to run the tunnel construction northward by a semicircular curve to a terminal in Hoboken adjacent to the Lackawanna Station, and also to curve off to the south and thus reach the Erie Station in Jersey City. Further, by constructing a short section, direct connection might be established between the two cities. These plans involved three junction points, one at the shore where the two curves separated; the others where the short section joined these two curves.

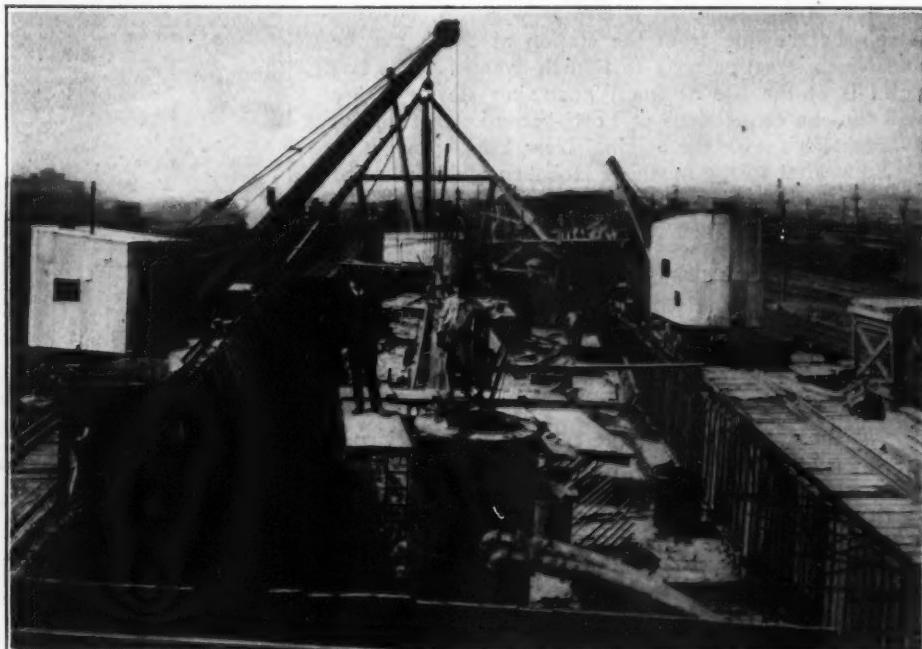


Fig. 12.—The Caisson for a Junction on the Jersey Shore.

The Hudson tubes were continued by the use of the shield, an iron plate lining and compressed air. A tube was also started from the New York side to meet the northerly and longer one of those going out from the Jersey City shaft. This last tube had only penetrated about 160 ft. when work was suspended. The Jersey tube which was to meet it had been lengthened until it measured 3916 ft. long. Altogether there was now constructed 4646 ft. of tunnel, 4076 ft. belonging to one tube. Upon the resumption of work later on it was on the completion of this tube

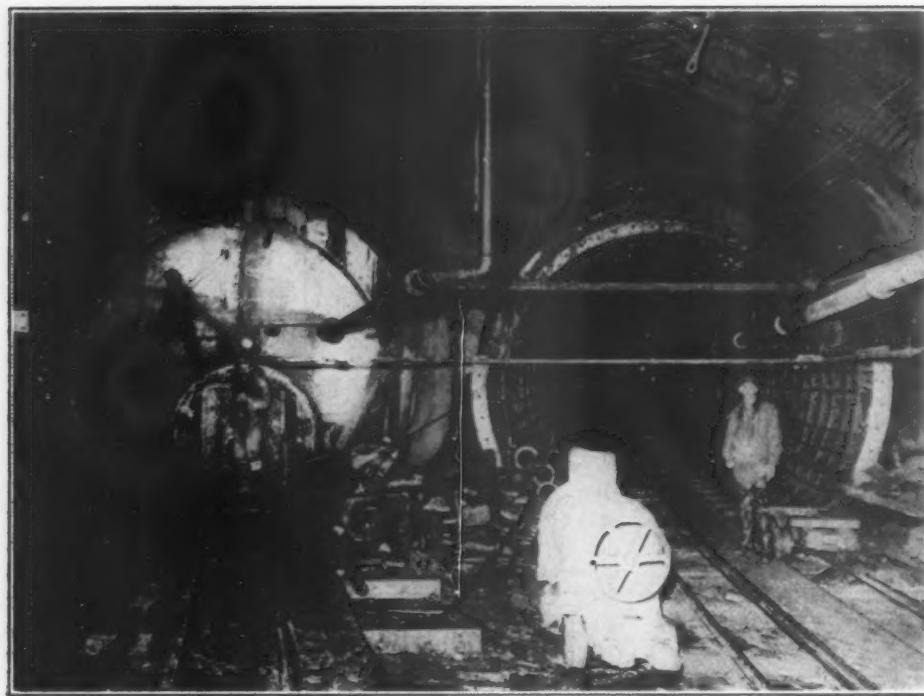


Fig. 13.—An Interior View of the Same Caisson Over a Year Later.

The first of the subaqueous tubes joining the two banks was completed in 1904. In 1908 regular trains began to run between Hoboken and the New York station at the junction of Sixth avenue and Nineteenth street. Before this it was decided that two other tubes should be pushed beneath the Hudson connecting a downtown New York terminal at Fulton and Church streets with the Pennsylvania Railroad station in Jersey City. By connecting with the tubes to the north in the vicinity of the Erie station the whole system of four subaqueous tubes would be unified and an independent connection established between Hoboken and the two railroad stations in Jersey City. At present almost this entire system is in operation, plus an additional station in New York at Sixth avenue and Twenty-third street. Construction along Sixth avenue is to be continued to Forty-second street and thence easterly to the Grand Central Station of the New York Central Railroad. A tunnel has already been constructed from this point easterly beneath the surface of Manhattan Island, then under the East River, to connect with the Long Island side. This tunnel is not now in operation. It is also proposed to construct a sub-surface line from the station at Sixth avenue and Ninth street easterly to Fourth avenue. This last point is at the site of the Wanamaker store. There will thus be connections at Forty-second street and at Wanamaker's with the original New York subway.

Somewhat to the north of Hoboken and at a point about opposite Thirty-fourth street, in New York, the Pennsylvania tubes pass beneath the western shore of the Hudson and do not rise to the surface until far to the east in Long Island. This railroad will not only enter New York, but will pass through it and connect with New England by way of Long Island. Entrance into Long Island is by tube; exit from it and connection with the mainland to the north will be by way of a great steel bridge.

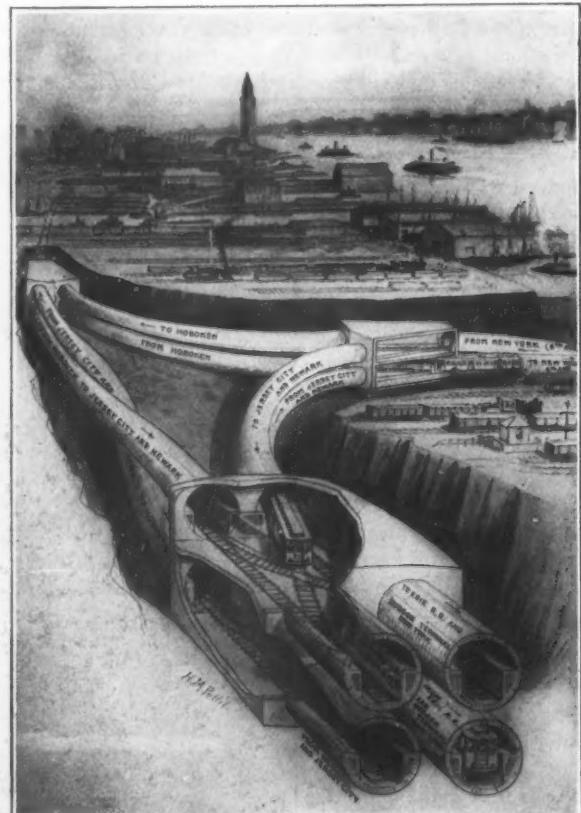
All but a small part of the subaqueous tunnel construction about New York has been by means of the shield. Details have varied, but the general character of the several shields has been the same. Fig. 7 shows a shield used by the Hudson Companies. Although somewhat of a wreck, the general structure of its bulkhead framework may be distinguished. This shield has penetrated the wall of a caisson constructed on the Jersey side at one of the points of junction referred to before. At the rear may be seen the front edge of the

iron lining. When a shield is jacked forward the length of a section of the lining, one ring will pass out of the shield at the rear. It drops down an amount equal at least to the thickness of the shield shell. The roof of the excavation, if the material is soft, will settle down at once upon the top of the lining. This is a defect attaching to this method of construction, since it is desirable to cover the outside surface of the iron lining with Portland cement grout. It seems that no practical method is known by which this premature settlement of the roof can be averted.

Fig. 8 is a view of a shield from the rear. The face of the excavation

may be seen through openings in the bulkhead or diaphragm. By close inspection a number of the jacks may be discerned; three are in view in the lower left-hand quadrant. It has been found better to disconnect the apparatus employed in the erection of the lining from the shield. While the shield in Fig. 8 is in normal position, that in Fig. 7 shows that rotation has occurred, which it is scarcely practicable to avoid. It is permitted until it begins to interfere with operations, when the shield is righted by special efforts.

In Fig. 8 dead rollers may be seen arranged at mid-elevation on each side. Upon these the platform carry-



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Fig. 14.—A View of the System of Caissons for the Connections of the Hudson Companies' Tunnels on the New Jersey Side.

ing the erecting apparatus is moved forward. The erector consists essentially of a ram or plunger which may be moved back and forth in a radial direction. By suitable devices this plunger and its case may be rotated. In this way every point in the circuit of a ring of lining may be commanded. The outer end of the plunger may be seen in Fig. 8 near the head of the man on the right. A typical ring consists of nine segments of cast iron, all of about the same length, and one short segment used to effect closure. Near the center of gravity of an ordinary section a special lug is cast, to which the outer end of the erector plunger is temporarily bolted while lifting and placing the segment. Each segment is flanged on all four edges and drilled to be bolted to adjoining rings and sections. Each ordinary segment has 18 bolt holes, and the key eight. Thus, 85 bolts are required for each ring. These are $1\frac{1}{4}$ -in., with rolled threads. The contacting surfaces of the flanges of the segments are finished to yield a tight joint.

In Fig. 8 may be seen a turntable, evidently used to prevent the lining from spreading. The shield propelling jacks are hydraulic, with a stroke of $2\frac{1}{2}$ ft., or 6 in. more than the length of a ring, thus providing ample clearance. The 16 of them each had a plunger diameter of 8 in., and at $2\frac{1}{2}$ tons per square inch each jack was capable of exerting a pressure of about 125 tons. The shield could, accordingly, be pressed ahead with a pressure of about 2000 tons. To allow such pressures the shield itself had to be very substantial. Upon at least one occasion the shield was driven through the silt at the rate of 1 yd. per hour for 24 hours. This is at the rate of 0.4 in. per minute.

Fig. 9 is a close view of the rear end of a shield, clearly showing the jacks. Apparently this shield is still in the shaft and has not started actual service. Fig. 10 is a view of a portion of the tunnel system of the Hudson Companies after completion of the tube itself, but before laying of track.

The length of tube actually under air pressure may be considerable, which is an advantage, as already explained, but wherever the bulkhead is situated it is subjected to a total pressure that is proportional to the area of its face. In work carried on by the Hudson Companies a tension as high as 48 lb. per square inch was employed for a short time; if this was borne by a single bulkhead 18 ft. in diameter, the total amounted to nearly 900 tons.

Fig. 11 is a view of one of the Hudson Companies' systems of air locks. The locks are shown in a bulkhead securely intrenched in the solid rock. The main lock has its door open. Although but a single track passes through it, the exterior arrangement of tracks permits its use both for incoming and outgoing cars. This lock is for the passage of men and the bulk of the freight. Another lock above is an emergency chamber and is purposely located high, so that if the tube is flooded it will be serviceable longer than it would otherwise.

Of the two tubes which were first constructed between New Jersey and New York, the north one carries the outbound track from New York and the south one the inbound track. On the Jersey side both tracks connect, with branches off to the north and to the south. To avoid crossings the outbound junction is superimposed upon the inbound one. The necessary thinning of the walls of earth between the tunnels in the vicinity of the points of junction and the actual junctions themselves necessitated special constructional provisions. A concrete and steel caisson 101 ft. long and 51 ft. deep was sunk to provide suitable chambers to receive the tube ends. There were two decks or stories, the upper for the outbound junction and the lower for the inbound one. This caisson was wider back from the shore to permit the divergence of the tracks. As water was to be encountered, this large structure was sunk by pneumatic methods. Fig. 12

shows this caisson. The wider or western end is in the distance. In the foreground, an air lock, together with its operating platform, is in plain view. The twisted rods of the reinforcement are everywhere in evidence. At each side is a track permitting cranes to be moved along the length of the caisson. One of the movable cranes is apparently serving the caisson through the air lock in front. Fig. 13 is an interior view of the same caisson about 14 months later, taken in the lower chamber, looking west. To the right is the tube carrying the inbound track from Hoboken. On the left is the inbound tube from the south (Jersey City). By close examination, the bolt holes of the end of the lining may be discerned. A bulkhead has been put in place, closing the opening. But access to the tube may be obtained through the air lock seen at the bottom. Reference has already been made to a short section joining the north and south curves and so enabling direct connections to be made between Hoboken and Jersey City. Two other caissons were sunk where the necessary junctions were made. The one to the north was very similar in form and dimensions to the one already described. Its narrow end was toward Hoboken. The southern caisson was rectangular in plan, $106\frac{1}{2}$ ft. long and 45 ft. wide, and had a depth of 44 ft. Each of these caissons had two stories. As their upper stories on the side next New York received the outbound tubes from the first caisson, and their lower stories received the inbound tubes, it will be seen that the two upper stories were not in agreement as to the direction of train movement and that the same was true as to the lower stories. This would have been a matter of no moment, perhaps, if it had not been for the short section making direct connection between Hoboken and Jersey City. To harmonize the disagreement, the two tubes constituting the short section were planned to twist slightly about each other and thus permit the joining of the lower story of one caisson with the upper story of the other. In consequence of the arrangement of the tracks described, no tube or its connections is operated in more than one direction. The southerly caisson not only received four tubes at its northern end, but four tubes pass from it at its southern end. The upper and lower tubes at the south end next the river after a passage southward, curve in again and recross the Hudson by the two tubes connecting with the extreme downtown district of New York. The remaining tubes from the south end are to connect with Jersey City and Newark. The shield shown in Fig. 6 is entering this rectangular caisson from the south. This view represents conditions in December, 1908. A portion of the general scheme of the Hudson Companies has not yet been developed. But already all four subfluvial tubes are in service. Fig. 14 is a view of the system of caissons and the corresponding tubes looking toward the north, with the Hudson River to the right. With the account already given, this drawing should be readily understood.

(To be continued.)

The Abendroth & Root Mfg. Company, Newburgh, N. Y., calls attention to the fact that installations of spiral riveted pipe 30 years ago must have been of pipe manufactured by that company, as it was then the only maker of such a product. This statement appears to have been rendered necessary by the appearance of publications by other and more recent manufacturers, who have referred to the satisfactory service rendered by such pipe, and probably have inadvertently omitted to mention that the installations made so long ago were by the pioneer company.

The first heat was taken at the new open hearth steel plant of the Maryland Steel Company, Sparrows Point, Md., March 2. There are five 50-ton tilting furnaces, and steel will be made by the straight open hearth or by the duplex process.

The American Institute of Mining Engineers.

The Pittsburgh Meeting.

The ninety-eighth meeting of the American Institute of Mining Engineers was opened on Tuesday, March 1, at the Carnegie Lecture Hall, Pittsburgh, with rather a small attendance, although the proportion of older members who had gathered was conspicuously large. Owing to the unavoidable absence of Julian Kennedy, who was to deliver an address of welcome, Dr. John A. Brashear, the well known scientist, spoke of Pittsburgh's ambition, so rapidly being realized, to become a center of learning, education and the fine arts. After due acknowledgment by D. W. Brunton of Denver, president of the Institute, Dr. R. W. Raymond read a biographical notice of the late Dr. Charles B. Dudley of Altoona, whose splendid professional attainments and lovable personal qualities had endeared him to all. H. P. Bope of the Carnegie Steel Company, in an admirable address, reviewed the career and pronounced a discriminating eulogy of the late William Metcalf of Pittsburgh, a past president of the Institute and a leader and a pioneer in the manufacture of high grade crucible steels.

Prof. Robert H. Richards of the Massachusetts Institute of Technology, Boston, presented a paper on the "Development of Hindered Settling Apparatus," tracing the steps, in the study of classifiers for concentrating ores, which have led to development of the apparatus, of which he is the inventor. Professor Richards, who is our foremost authority on ore concentration, has obtained truly wonderful results with machines which are remarkable for their simplicity and which depend for their operation upon "hindered settling" or upon the "teetering" of particles of material in currents of water. While chiefly applied thus far to lead and copper ores, the apparatus is likely to obtain more extended application, in the dressing of iron ores, which is being more widely introduced in this country.

The session was closed with a lecture illustrated by a series of lantern slides, by S. C. Beyl, on mining in Argentina.

Wednesday Morning's Session

was opened by F. Z. Schellenberg of Pittsburgh, who read a paper entitled "The Systematic Exploitation of the Pittsburgh Coal Seam." He sketched briefly the characteristics of that famous seam and classified the methods pursued in mining in the gas coal and coking coal districts, the width of rooms and ribs, and the withdrawing and advancing systems as affected by the necessity of keeping control of the roofs. He discussed the effect of considerations imposed by ventilation, by the desire to secure tonnage at an early date, and noted the influence, upon layout, of the introduction of machine mining. Mr. Schellenberg stated that under favorable conditions as high as 90 per cent. of the area of the Pittsburgh seam is extracted. An associate of Mr. Schellenberg explained in detail the method pursued in extracting the ribs, in retreating, in the coal district.

W. H. Blauvelt of Syracuse, N. Y., in a paper entitled "A Commercial Fuel Briquette Plant," described the works of the Solvay Process Company and the Semet-Solvay Company, at Detroit, Mich., which employs a mixture of coke breeze and dry noncoking coal from either the Hocking Valley or the Jackson Hill districts, with coal tar pitch as a binder. Mr. Blauvelt's paper is particularly valuable for the reason that it goes far beyond a mere description of the individual plant in giving details of cost and in discussing the causes of the failure of so many briquetting enterprises to attain commercial success. He dwelt, too, upon the future of the briquetting industry in attaining a smoke-

less fuel for domestic purposes in competition with anthracite. The paper was discussed by C. T. Malcolmson of Chicago, a specialist in coal briquetting, who referred particularly to the results obtained at the plant of the Standard Fuel Company of Kansas City. E. W. Parker of Washington noted that balls of coal had been made as early as 1600 and announced that the coal statistics for 1909 indicate that that year had shown a very marked development in the production of the briquetting industry.

George S. Rice, who has charge of the United States Geological Survey Testing Station at Pittsburgh, summarized the contents of his paper on "Dust Explosions in Coal Mines," which takes up particularly the question of the temperature and humidity of mine air in its effect upon the explosibility of coal dust. A very interesting contribution to the subject was presented by C. M. Young of Lawrence, Kan., in a paper entitled "The Gaseous Decomposition Products of Black Powder." Mr. Young has studied experimentally the gases of the explosion of black powder with a view to determining whether and to what extend they themselves are explosive, and as such may contribute to or originate mine explosions. He finds that on an average they yield about 50 per cent. of carbonic acid, 6 to 10 per cent. of carbonic oxide, 1 per cent. of methane and 35 to 40 per cent. of nitrogen. He draws the conclusion that, in the presence of dust coal and of gases distilled from coal, the products of combustion of black powder are combustible, besides stirring up coal dust dangerously. Mr. Young dwelt also upon the marked tendency among miners to use larger quantities of powder, until they have become coal shooters rather than coal miners. In Kansas the average tonnage of coal obtained from a 25-lb. keg of powder has declined to 16 tons. He holds that one of the principal causes of the greater frequency of coal mine explosions in recent years is the enormously increased quantity of powder used.

The session closed with a brief paper by J. A. Holmes of the United States Geological Survey on the work of the technological branch at Pittsburgh. This was largely explanatory of the plant and the work of the United States Geological Survey Testing Station at the Arsenal at Pittsburgh, which the members visited in the afternoon, and where they witnessed a series of highly interesting tests.

Wednesday Evening's Session

In the evening Dr. David T. Day of Washington spoke on the "Accumulation of Petroleum in the Earth." It was not his purpose to discuss the genesis of petroleum, but to account for some of the striking variations in the character of oils of individual fields and of the similarities of oils of distant fields. Dr. Day holds that the shales act in very much the same way as does fuller's earth in the laboratory in the fractionization of oils, and submitted the results of numerous experiments in that direction.

Professor Wadsworth of the School of Mines of the University of Pittsburgh spoke on the somewhat radical ideas which have been adopted in the principles underlying the objects of that institution. Professor Crabtree outlined the aims of the educational work of the four departments of the Carnegie Institute, which is now teaching 2000 pupils. The tuition is exceptionally low, and, contrary to the opinion generally prevailing, its endowment is only partly adequate to meet the requirements of the broad field which it aims to cover.

E. Gybon Spilsbury of New York brought forward a "New Method of Cyaniding Gold and Silver Ores." It consists in using a new product known as "silica-sponge," which is being manufactured at Syracuse, N. Y., by the Just Process Company of 45 Broadway, New York, and which possesses extraordinary properties. Mr. Spilsbury submitted a series of results obtained in different cyaniding mills in this country and

in Mexico, which show that the yield of the precious metals has been very greatly increased, with a notable saving in time. Mr. Spilsbury has also developed what he calls a catalytic tile, which holds out unusual promise of better results in the manufacture of sulphuric acid. Silica spong has also attractive probabilities as a filtering material.

Arthur Dwight of New York presented a paper on further results obtained with his method of blast roasting for lead and copper ores, which has been introduced in a number of large plants.

Friday's Session.

The last session, on Friday, was crowded with papers. It is worthy of note that in number, variety and scope, the professional contributions to the American Institute of Mining Engineers have shown a marked development. It is in the attendance at meetings that the Institute shows such a striking contrast to the gatherings of other technical societies.

Dr. Robert Bell of the Canadian Geological Survey, Ottawa, Canada, in the course of a summary of his paper, "The Huronian as a Gold Bearing Terrane," dwelt upon the effect of the glaciation upon the Huronian areas of eastern Canada, and expressed the opinion that many gold mines will be developed. He pronounced the Klondyke gold to have been derived from the Huronian, in which it was widely distributed. Enormous thicknesses of the rocks, possibly up to 2 miles, have been disintegrated in place, the gold being concentrated in the narrow V-shaped channels. In the Klondyke there was no glaciation which removed the decayed rock and its gold contents.

Walter O. Snelling of Pittsburgh, a facile and logical speaker, presented an interesting paper on "The Action of Explosives on Rocks of Different Degrees of Hardness." He explained the principles which should guide in the selection of explosives, in mining, under varying conditions.

Iron and steel makers will read with deep interest the paper by George W. Maynard of New York on "The Introduction of the Basic Steel Process in the United States." Mr. Maynard, who was the representative in this country of Thomas and Gilchrist, has added to his records of the introduction of the basic process the evidence of those who were identified with the work at different plants.

In a paper by David B. Rushmore of Schenectady on "Electric Mine Hoists," an elaborate analysis was presented of the electrical and mechanical requirements of hoisting, diagrams being shown relating to the ordinary reel, the conical drum, the combined cylinder and conical drum, and the Whiting drum. Mr. Brunton, president of the Institute, referred in the discussion to the admirable work being done at a mine in Idaho with an electric hoist.

E. F. Burchard of the Geological Survey spoke on "The Investigations of Structural Materials for Use in Federal Buildings," the materials referred to being granites, marbles, concretes, sand, limes, &c. Mr. Burchard showed a map of the country, indicating the location of the 350 buildings on which the United States Government was engaged in 1908, these public buildings involving an outlay of \$50,000,000. The survey is co-operating with the office of the supervising architect in studying the sources of building materials, often of local interest only, and their quality. This study is not alone of very great importance to the government as a builder, but to the country at large.

J. L. W. Birkinbine of the Birkinbine Engineering Offices, Philadelphia, outlined the contents of his paper on "Coal and Iron Ore in Western Oaxaca, Mexico." Mr. Birkinbine has spent several years in the exploration of a district in the state of Oaxaca, which, while it was supposed to contain coal and iron, had been visited by very few engineers. He has studied the

field from a geological and economic point of view and has made topographic surveys, the general result of which has been the location of a promising field of what is very close to anthracite coal and a district capable of producing bituminous coal of fair quality. Iron ores have been located in quantity, being magnetites and limonites, high in quality, both as to percentage of metal and low contents of sulphur and phosphorus. Surveys show, too, that, despite the mountainous character of the region, it can be tapped by a railroad with a maximum grade of 2 per cent.

During the sessions there was shown for the first time a portrait by Farley, a Philadelphia artist, of the late Thomas M. Drown, who for many years was secretary of the institute. The portrait, which is an excellent likeness of Dr. Drown in the days of his active connection with the Institute, was presented to the society by James Gayley, Dr. James Douglas and Dr. R. W. Raymond.

Hydroelectric Power Development in Russia.

The March *Proceedings* of the American Institute of Electrical Engineers says:

As a result of the development and successful operation of high tension transmission lines in the United States, interest in electrical engineering progress in this country is rapidly growing in Russia. This has been stimulated by the recent investigations of Prof. H. J. Ryan and Ralph D. Mershon. The Ministry of Ways and Communication at St. Petersburg has become interested in a scheme of hydroelectric power transmission which will involve the electrification of suburban divisions of the state railroads, and the subject is now under consideration. As some doubt seemed to exist in the minds of some of the officials as to the reliability of a 100,000-volt transmission line as compared with a 60,000-volt line, the latter being the highest in use in Europe, telegraphic inquiries have been made of some of the leading men in the electrical engineering profession in America as to the comparative merits and reliability of the two lines. Prof. M. A. de Chatelain of St. Petersburg, an associate of the American Institute of Electrical Engineers, and one of the most enthusiastic exponents of hydroelectric development in Russia, has been invited to make a demonstration of some high tension transmission experiments with new types of insulators and different sizes of conductors before the officials interested. The advance of electrical engineering in Russia is likely to open a new and extensive field to American engineers.

The Ford Chain Block Company.—F. J. Ford and Clement Restein have formed a partnership, under the name of the Ford Chain Block Company, 133 North Second street, Philadelphia, Pa., to engage in the manufacture of chain blocks. One of their specialties is the Triblock spur gear chain lock, in which are used cut steel gears, drop forged steel hooks, steel crossheads and driving pinions and the best quality of tested and hand-welded chain. This selection of materials makes possible a block that is most compact and of great strength. All parts are interchangeable and the workmanship and care exercised in the construction are claimed to conduce to easy working and long life.

At the Alabama City, Ala., plant of the Southern Iron & Steel Company the first heat of 50 tons was taken March 2 at the open hearth department after the recent rebuilding and overhauling. There are six furnaces, the four originally built and two, on which construction was begun a few years ago, recently completed. It is expected that the rod mill at Alabama City will start up April 1 unless weather conditions are unfavorable.

The Thomas Basic Process.*

History of Its Introduction Into the United States.

BY GEO. W. MAYNARD, NEW YORK.

At the Pittsburgh meeting of the American Institute of Mining Engineers in May, 1879, I made the first announcement in America of the results obtained by Sidney Gilchrist Thomas and Percy C. Gilchrist in their efforts to eliminate phosphorus in the manufacture of steel in the Bessemer converter and the open hearth.

The first published statement in an American newspaper appeared in *The Iron Age* in 1879 and was a reprint of the first Thomas-Gilchrist paper which I sent to James C. Bayles, at that time the editor. At the suggestion of many of my friends who were present at the Pittsburgh meeting and others who are cognizant of the beginnings of the process in this country, and for the information of the younger generation of the iron and steel fraternity, I have thought it eminently proper that the history of the process in detail should be given where I made the first announcement and where the process has had its largest development.

During my residence in England from April, 1873, to February, 1879, and membership in the Iron and Steel Institute since 1874, I was present at many of the meetings of that institute during those years. At nearly every meeting the burden of discussion was the question of the employment of pig iron containing phosphorus in the manufacture of steel by the Bessemer and open hearth processes.

Years of Investigation by Thomas.

In my biographical notice of Thomas, read at the New York meeting of the American Institute of Mining Engineers, February, 1885, I show that the working out of the process was not a haphazard or accidental inspiration, but, on the other hand, the culmination of many years of investigation of the experiments and theories which had been carried on and advanced by chemists and metallurgists at home and abroad.

The foundation of Thomas's great achievement was his chemical knowledge, having passed an examination in inorganic chemistry "first class advanced" at the School of Mines in Jermyn street, as the outcome of attending night lectures and working in a little laboratory at his cottage in Battersea, where it was my good fortune to spend many evenings with him. He supplemented his chemical work by visits to English, Belgian and German iron and steel works when he could get away for short periods from his exacting duties in the Thames police court.

The First Announcement Before the Iron and Steel Institute.

At the March meeting of the Iron and Steel Institute in London in 1878, at which I was present, I. Lowthian Bell read a paper on "The Separation of Phosphorus from Pig Iron." In the discussion which followed George J. Snelus stated that six years before he "took out a patent for using lime for the lining of steel melting and other furnaces"—a patent which was still valid and that he had then casually told a good many members of the institute that he had succeeded in reducing phosphorus in Cleveland pig iron to less than 0.1 per cent. by using limestone as the lining of his furnace. There were, however, practical difficulties in applying the lime both in the Bessemer converter and in the Siemens rotary furnace, and he had been beating his brains about for several years in order to overcome them.

Among those who took part in the discussion was a young man, a visitor, who stated that he had suc-

ceeded in effecting the almost complete removal of phosphorus in the Bessemer process. Experiments had been carried out at Blaenavon, with the co-operation of E. P. Martin, on quantities varying from 6 lb. to 10 cwt., and some hundred analyses made by Mr. Gilchrist (who had the conduct of the experiment from the first) showing the removal in the converter of from 20 to 99.9 per cent. of phosphorus. He believed the practical difficulties in the way had been overcome and that Cleveland pig iron might be made into good steel without any intermediate process; he hoped on a future occasion to lay full details before the institute. The young man was Sydney Gilchrist Thomas.

J. S. Jeans, who was present and subsequently became the secretary of the institute, in his work on "The Creators of the Age of Steel," says: "The meeting did not laugh at the youthful Eureka, nor did it congratulate the young man on his achievement, much less did it inquire about his methods of elimination. It simply took no notice of his undemonstrative announcement."

A. L. Holley Calls Attention to the Process.

On Saturday, September 14, 1878, A. L. Holley and I had planned to leave London to attend the Paris meeting of the Iron and Steel Institute. As we were about starting for the Charing Cross station I was summoned to the North of England on some engineering work. We parted with the expectation of meeting in Paris within a day or two. My work prevented my going. Within a week I received a letter from Mr. Holley inclosing a paper which had been submitted to the Council of the institute for presentation at the Paris meeting. The title of the paper was "On the Elimination of Phosphorus in the Bessemer Converter by Sidney G. Thomas, F.C.S., and Percy C. Gilchrist, Associate Royal School of Mines, F.C.S." Mr. Holley in his accompanying letter said: "This looks all right, and if upon examination you find it to be so you had better get control of the process for the United States."

The simplicity of the chemistry of the process and the vast possibilities immediately appealed to me, so without delay I telegraphed to Mr. Thomas through Mr. Deby, the foreign secretary of the institute, to call on me on his return to London with the view of taking up the process for the United States.

To quote from R. W. Burnie's memoir of S. G. Thomas: "The paper was not read at the Paris meeting, although it had originally been placed near the top of the list, but belief in the alleged discovery of an unknown youth had not much spread since March, and the paper was removed to the end, and then left by the authorities unread for 'lack of time.'"

The Process Introduced by Bolckow, Vaughan & Co.

Windsor Richards, the manager of Bolckow, Vaughan & Co.'s works at Middlesbrough, was at the Paris meeting. In his presidential address to the Cleveland Institution of Engineers he said:

Messrs. Thomas & Gilchrist prepared a paper giving very fully the results of their experiments, with analyses. It was intended to be read at the Paris meeting in 1878, but so little importance was attached to it, and so little was it believed in, that the paper was scarcely noticed, and it was left unread. Mr. Thomas first drew my particular attention to the subject at Creusot, and we had a meeting a few days later at Paris, when I resolved to take the matter up, provided I received the consent of my directors. That consent was given, and on October 2, 1878, accompanied by Mr. Stead of Middlesbrough I went with Mr. Thomas to Blaenavon. On arriving there Mr. Gilchrist and Mr. Martin showed us three casts in a miniature cupola, and I saw enough to convince me that iron could be dephosphorized at a high temperature. I also visited the Dowlais Works, where Mr. Menelaus informed me that the experiments in the large converters had failed owing to the lining being washed out.

The outcome of Mr. Richards' investigation was the erection of a pair of 30-cwt. converters at the Eston Works of Bolckow, Vaughan & Co., at Middlesbrough.

* Read at the Pittsburgh meeting of the American Institute of Mining Engineers, March, 1910.

At the beginning they were confronted with the difficulty of making basic brick for the converters. Their difficulties were finally overcome, so that on April 4, 1879, they were able to show the iron manufacturers of Middlesbrough "an absolutely successful operation."

Mr. Maynard Meets Mr. Thomas.

On Mr. Thomas' return to London in September, 1878, he called on me at my request with a view to a personal investigation of the process and its adoption in the United States. At that time I was consulting engineer for the Standard Iron & Steel Company, a Manchester corporation, with works at Gorton, a suburb of Manchester.

As a substitute for a two-converter Bessemer plant the company had been induced to adopt a process which was to produce steel from any grade of pig. The practical demonstration promptly resulted in the abandonment of the process, leaving, however, a "receiver," an oblong ganister-lined box with tuyeres on both sides, somewhat on the lines of the Clapp-Griffiths plant. I suggested to Mr. Thomas that a test of his process be made in this receiver, which he thought would be quite feasible and much less costly than the lining of a Bessemer converter.

On consultation with the Standard Company's directors they authorized me to go ahead and voted the necessary funds for carrying on the investigation. In order to make the test as severe as possible I concluded to make the demonstration at Middlesbrough.

The Test at the Acklam Works.

The proprietors of the Acklam Works very kindly permitted me to set up the receiver at the lower end of the pig bed, the blast pressure of $2\frac{1}{2}$ to $3\frac{1}{2}$ lb. being furnished by the blast furnace blowing engine. Messrs. Thomas and Gilchrist and Mr. Stead, the eminent chemist of Middlesbrough, were present, besides some of the officials of the Acklam Works. The basic brick (dolomite) were burnt in an ordinary brick kiln, and, as it transpired, at too low a temperature. The first heat was made December 18, 1878, and the second on the 20th. In both cases the charge was 5 tons of No. 3 iron, containing 1.63 per cent. of phosphorus.

In the first charge the resultant metal contained 0.45 phosphorus and no silicon, and the cinder 7.05 phosphoric acid with 31 silica. In the second charge, with the same grade of iron, the product contained 0.28 phosphorus and a trace of silicon. The samples were taken by Mr. Stead, who also made the analyses. The product was a bad looking mess, as much of the basic lining floated out of the box along with the steel. I believe these blows were the first after the South Wales experiments. They were shortly followed by the erection of the plant at Eston, and to Windsor Richards is due the credit of having made the first commercial success and for the facilities which he afforded English and foreign steel manufacturers for studying the process. The following analyses show results of the early experiments as carried out at Bolckow, Vaughan & Co.'s Eston Works by Mr. Richards, confirming triumphantly Mr. Thomas' theory and predictions:

	Metal after blowing for					
	Original pig. min.	6 min.	12 min.	end of blow.	16 $\frac{1}{2}$ min.	end of blow.
Carbon	3.57	3.40	0.88	0.07	trace	trace
Silicon	1.70	0.28	0.01	trace	nil	nil
Phosphorus	1.57	1.63	1.42	1.22	0.14	0.08
Manganese	0.71	0.56	0.27	0.12	0.10	trace
Sulphur	0.06	0.06	0.05	0.05	0.05	0.05

The Acklam experience confirmed me in my wish to take up the process for America. Then followed almost daily conferences with Mr. Thomas on patent and working details up to the time of leaving for New York in March, 1879.

In the manufacture of basic brick, or furnace linings, the serious drawback was the slacking of the lime when water was used. This difficulty was overcome by

the knowledge and ingenuity of Edward Riley, the eminent metallurgical chemist, by substituting gas-tar or petroleum for the purpose of making the hard burnt dolomite plastic before molding. I was with Mr. Riley during many of his experiments. Patents were finally granted him on November 25, 1878. I was appointed by Mr. Thomas agent for the United States for the granting of licenses or sale of the patents and for the securing of patents which had not yet gone to issue. Subsequently I was empowered by Mr. Riley to act for him.

Horace W. Lash First to Test the Basic Process in an Open Hearth Furnace.

It is extremely gratifying to inform you that one of our members, Horace W. Lash, formerly of Pittsburgh and now of Cleveland, was the first man to test the basic process in an open hearth furnace. Mr. Lash has kindly furnished me with a statement of his work in Belgium in the following letter:

I met Mr. Thomas at the autumn meeting of the Iron and Steel Institute, which was held in Paris in October, 1878. Up to this time Mr. Thomas had done but little, if anything, with his lining in the open hearth furnace, his experiments being confined largely to the Bessemer converter in the old plant at Dowlais, South Wales. I advised Mr. Thomas that in my opinion the Ponsard Furnace, with which he had been making a number of experiments at Thy-le-Chateau, Belgium, would be a good furnace in which to try out his process, as it would be possible to line the bottom or revolving part of the furnace with his lining, allowing the roof and ports to remain the usual construction of silica brick. In this way there would be a natural dividing line between the two materials, which division or separation appeared to be a serious problem at that time.

Mr. Thomas was highly impressed with the possibilities of working his process in this type of furnace. In consideration of this we proceeded to Thy-le-Chateau, where we spent several days in looking up suitable material for lining. This we found in a highly magnesian limestone near by the works. We had a quantity of this material quarried and delivered at the experimental plant, where it was ground into a fine condition and mixed with about 3 per cent. of silicate of soda. With this mixture we made a rammed lining of 16 to 18 in. thick. Our first trial heats consisted of about 2 tons of old steel rails and 4 tons of local pig iron, which carried about 2 per cent. phosphorus. Our first heat analyzed 0.14 phosphorus; our second heat, 0.30. The high phosphorus in the second heat no doubt was largely due to some of the silica bricks which toppled from the edge of the ports into the bath. Mr. Thomas was very highly pleased with the results obtained, and after running several more heats we had the furnace relined and made some further trials, of which I have mislaid the records. These trials were all made during the month of November and the early part of December, 1878.

Shortly after this I left for London, where I met you with Mr. Thomas, at which time you will no doubt remember Mr. Thomas writing the letter inclosed herewith, dated December 14, 1878, agreeing to pay me certain royalties, after deducting your regular commission, providing I succeeded in introducing his process with certain open hearth furnace people in the United States. I reached this country the early part of 1879, after which I had considerable correspondence with Mr. Thomas, but owing to the disinclination of the American steel manufacturers to take up the basic process in connection with open hearth furnaces, I allowed the matter to drop, and thereafter took but little interest in the introduction of the basic process in this country or elsewhere.

After my return to New York in March, 1879, until the following May much of my time was spent at the Patent Office in Washington in an effort to educate its metallurgical department. Many of the interferences entertained by the department had no direct hearing on the claims set forth in Thomas' patent applications. Finally the five foundation claims of Mr. Thomas were patented. During this period I received many applications for licenses on the patents going to issue. The first license was granted to Shoenberger & Co., Pittsburgh, with the intention of using a basic lining for their open hearth furnaces. I am not aware that they adopted the processes during the life of the patents.

The First American Open Hearth Tests Made at the Otis Works, Cleveland.

The first open hearth tests were made at the works of the Otis Steel Company, Cleveland, Ohio, by S. T.

Wellman, who was then the manager of the works. Mr. Wellman has been so good as to furnish me with the following statement:

While traveling in Europe in 1885 I saw the first basic open hearth steel made. I was so interested in it, and so impressed with the high class product which they were able to make out of the very impure iron, that I purchased from Carl Spaeter at Coblenz a small cargo of 800 tons of raw Styrian magnesite. We did not do anything with it until the following year, when I put in the first bottom in one of our 15-ton open hearth furnaces. I did not take out the old silica lining, but simply burned it down some 6 or 8 in. below the usual lines. I then rammed up the bottom with magnesite and tar, the magnesite having been previously dead burned in one of our open hearth furnaces. This bottom did not do very well, as the burning out of the tar made it so porous that the steel was constantly breaking through and giving us trouble. We ran the furnace several weeks with varying success. We did not use a very high phosphorus pig iron, most of it being the ordinary Bessemer pig containing from 0.10 to 0.15 phosphorus. This comprised about 50 per cent. of the charge, the balance being ordinary cheap miscellaneous steel scrap.

Nearly all of our product was first class in every respect, being fully equal, and some of it superior, to the steel made from northern New York charcoal blooms, which was the material which we generally used in our high class steel. The product was very satisfactory, but the output of the furnaces was considerably less in quantity than what we could make by using the ordinary acid steel process used in high class material. On that account we finally gave up the use of the process for the time being, as we were behind our orders, and it was very important that our works turn out the highest amount possible in steel.

It is interesting to me to note that to-day practically all the basic open hearth furnaces in the United States use magnesite from the identical mines from which I obtained this small cargo. Practically the only difference between our practice in these first experiments and the standard practice of to-day is that in making the bottom the finely ground burnt magnesite is burnt into the bottom in thin layers, treating it exactly as they would the same quantity of silica sand in making an acid steel bottom. The practice in charging furnaces to-day is to charge as much of the material as possible in the initial charge, the bulk of the limestone necessary for the dephosphorization being put in with the charge. Our practice in those days was to add the limestone after the material was all charged. We also tried to remove the slag, thinking it was necessary in order to get good dephosphorization.

Negotiations with Andrew Carnegie.

In the latter part of September, 1879, Mr. Carnegie arrived in New York from England and informed me that he had called on Thomas in London and had contracted with him to purchase the basic patents for the United States for a certain amount in cash, and that it was his intention to sell the patents to the Bessemer Company, Ltd., which company was composed of the original 11 Bessemer plants. The outcome of many conferences with Mr. Carnegie was my offer of the patents to the Bessemer Company, which involved many meetings in Philadelphia. The offer embraced the Snelus patent, which was controlled by Abram S. Hewitt and Edward Cooper, together with the Riley and Thomas patents.

I granted an option of purchase for a specific period, during which time Mr. Holley, the consulting engineer of the Bessemer Company, went to Europe to visit the plants which had already adopted the process. The option period was subsequently extended for two months on the advance payment of a portion of the purchase price. Thomas arrived in New York the latter part of March. Mr. Hewitt had been selected by all the parties in interest to distribute the final payments. The dinner given to Mr. Thomas at Delmonico's, and presided over by Mr. Hewitt, was a memorable one, the principal steel works of the country being represented by their officials. Thomas' letter of April 2, 1881, addressed to his mother, is worthy of reproduction:

The dinner is happily past and I actually enjoyed it, partly. It was dreadful sitting for 3 hours and being praised, but the speakers were really clever and witty in the extreme—alternating between flights of real eloquence and the most fanciful word-fun and wildest jokes. The actual dinner was, of course, superb, costing about £200. I got through my speech fairly, I think. I had brought over

a first-class one, but couldn't think of a bit, so started on quite another line.

Basic Bessemer Steel Made at Steelton and Pottstown, Pa.

Not until the spring of 1883 was the manufacture of basic Bessemer undertaken. This was at Steelton, at the works of the Pennsylvania Steel Company. I am indebted to John C. Jay, Jr., of the Pennsylvania Company, and John S. Kennedy, formerly superintendent of the blast furnace department of that company, for the following data:

I was superintendent of the blast furnace department of the Pennsylvania Steel Company at Steelton for a number of years. On the completion of the new Bessemer plant the old one, containing two 5-ton converters, was available for experiments, and basic Bessemer steel was there made in 1883. The pig iron for this basic steel was nearly all made in our No. 5 furnace, a small furnace making about 50 tons daily. The balance was Montour iron, made probably from puddle cinder, analyzing 3.50 to 3.799 per cent. phosphorus, but about 0.06 per cent. manganese. Our basic pig was not so high in phosphorus, but quite high in manganese, as the following analyses will show:

Silicon	0.48	1.15	1.32	1.28
Phosphorus	2.094	1.817	1.80	1.754
Manganese	2.740	4.080	4.08	2.580
Sulphur	0.050	0.030	0.03	0.035

We then increased the percentage of phosphorus in the pig and reduced the manganese, using small quantities of converter scrap and slag for the above purpose. The pig iron then ran:

Silicon.	Phosphorus.	Manganese.	Sulphur.
0.62	3.833	1.800	0.030
0.87	3.704	1.770	0.050
0.35	3.940	2.390	0.060
0.53	3.734	2.440	0.050
0.48	1.373	3.811	0.030

This was about the iron we intended to make, but variations in the phosphorus and manganese in the mill cinder and ore used made the iron very irregular in these elements. No. 5 furnace was burned down November 21, 1883. The steel made was of excellent quality and very soft. The process proved to be expensive and was abandoned.

JOHN S. KENNEDY.

The first basic Bessemer steel made at Steelton was made in our No. 1 Bessemer converter May 7, 1883. The pig iron for this was made at the old Docklow Furnace, which stood where the steel foundry is at present. We also used some Lochiel iron made when this furnace was owned by John Q. Denny & Co. This iron contained 3½ per cent. phosphorus, under 1 per cent. silicon and about 1 per cent. manganese. The length of blow was about 20 to 30 minutes; in most cases this steel took from 5 to 8 minutes overblow before the phosphorus was eliminated.

The lining was made from a magnesian limestone, containing about 45 per cent. magnesia. This was calcined in a kiln, then ground to the size of a pea, mixed with anhydrous tar so to hold it together, rammed in the vessel, making a complete basic lining. The analysis of the steel made was carbon, 0.10; manganese, 0.50; phosphorus, 0.040; sulphur, 0.050. This analysis is as near as we can remember. The steel made with this process was very wild in molds due to so much overblow in getting rid of the phosphorus.

JOHN C. JAY, JR.

The second basic Bessemer plant was erected at the works of the Pottstown Iron Company, Pottstown, Pa. For the following data I am indebted to Joseph Hartshorne, at that time the manager of the works:

Started building June, 1885. Started blowing July 1, 1886. Stood idle from August, 1888, to August, 1890. Shut down August 15, 1893. Double turn from September 1, 1892, to end. I cannot give you the total tonnage as the records are not in my possession. It may have been between 300,000 and 500,000 tons.

The shutting down of the works followed the failure of the company in February, 1893. The principal factor was the cost of pig iron. When we started we had \$2.50 in our favor between the price of Bessemer and our own pig, when we stopped Bessemer sold at 60 cents a ton less than we could make our pig for and our process cost about \$1 more than the Bessemer. The inference is obvious, due in a great measure to Mesaba.

A full description of the plant was given by Mr. Hartshorne in his admirable and instructive paper read at the October, 1892, meeting at Reading, Pa. According to that paper, the phosphorus in the pig was 2.50 to 3 per cent. and in the finished steel 0.02 to 0.05 per cent.

The third basic Bessemer plant was erected at Troy. I have no data as to the outcome.

Last year's statistics of steel production almost confirm Holley's prophecy that the time would come when "the basic open hearth would attend the funeral of the Bessemer."

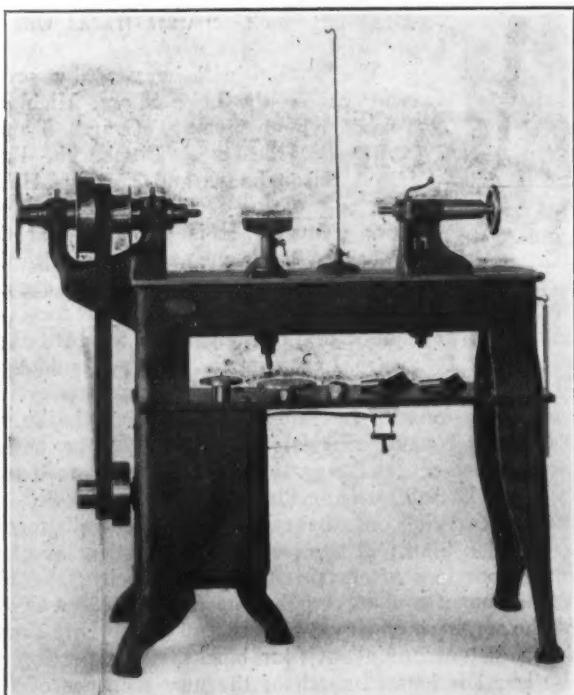
The four inventions which have revolutionized the iron and steel manufacture of the world are to be credited to four nationalities: Bessemer, although born in England, was the son of a Frenchman; the Siemens brothers, citizens of England, but born in Hanover; Thomas, a full blooded Englishman, and last but not least, our own Gayley—all within a period of 50 years.

In my completed paper I will undertake to show how many metallurgists were just on the border line of solving the phosphorus problem. It will also contain a digest of the various patents.

The Reed Motor-Driven Manual Training Lathe.

The 12-in. motor driven wood turning lathe, shown in the accompanying illustration, is especially designed by its builder, the F. E. Reed Company, Worcester, Mass., for use in manual training schools. The headstock is of the same general design as that of its predecessor, the 10-in. motor driven wood turning lathe, which was described in *The Iron Age* July 23, 1908, with the addition of an outer bearing and an outside face plate for turning large diameters.

The motor is mounted in a cabinet leg beneath the bed. By this arrangement, vibration is minimized and the motor is not readily accessible to the student and is out of the way of his feet. Inclosing covers protect the motor from dirt. A $\frac{1}{2}$ -hp. motor of either direct or alternating current type is employed. The motor shaft is belted with a $1\frac{1}{2}$ -in. belt to the lathe spindle through three-step cone pulleys of large diameter, giving a range of speed from 800 to 2500 rev. per min. The motor is mounted on four threaded studs and by means of the nuts can be easily adjusted vertically to give the correct belt tension. The starting box is



A 12-In. Motor Driven Wood Turning Lathe for Manual Training Schools, Built by the F. E. Reed Company, Worcester, Mass.

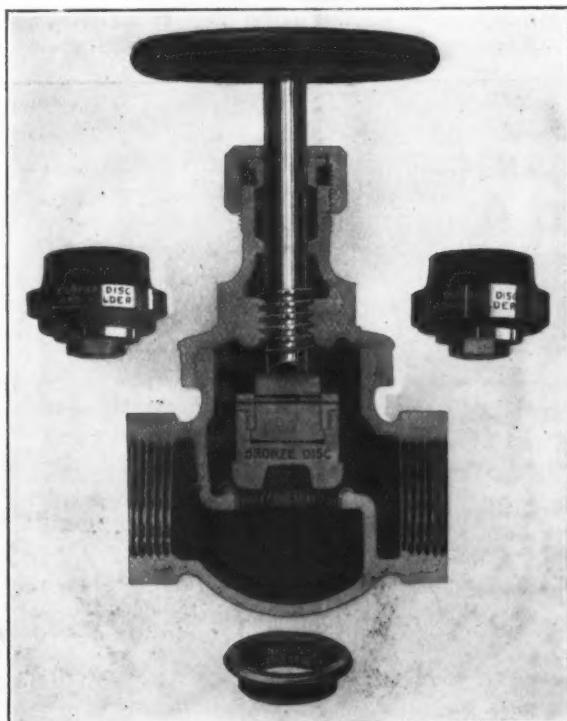
fastened to the under side of the lower shelf and can be operated either by hand or the knee of the operator.

The shelf beneath the bed and one at the back flush with bed surface afford resting places for equip-

ment and tools. Each lathe has a chuck plate, a screw face plate, the blue print holder and a plunger for knocking out the head stock center hanging in the illustration from the shelf at the right end. The machine is built in two sizes. With a 4-ft. bed, the distance between centers is 24 in.; the floor space required is 4 ft. 2 in. x 2 ft.; and the weight is 625 lb. With a 5-ft. bed there is a corresponding increase in the distance between centers and the floor space, and the weight is 25 lb. more.

The Huxley Renewable Seat Valve.

The particular features of the new Huxley bronze globe valve are the renewable seat and the interchangeable disks adapting the valve to various purposes. The general body of the valve is of the usual type, made



The Huxley Valve with Its Renewable Seat and Three Forms of Interchangeable Disks, Made by the Nelson Valve Company, Philadelphia, Pa.

only in bronze, in sizes for pipe ranging from $\frac{3}{8}$ to 3 in. in diameter.

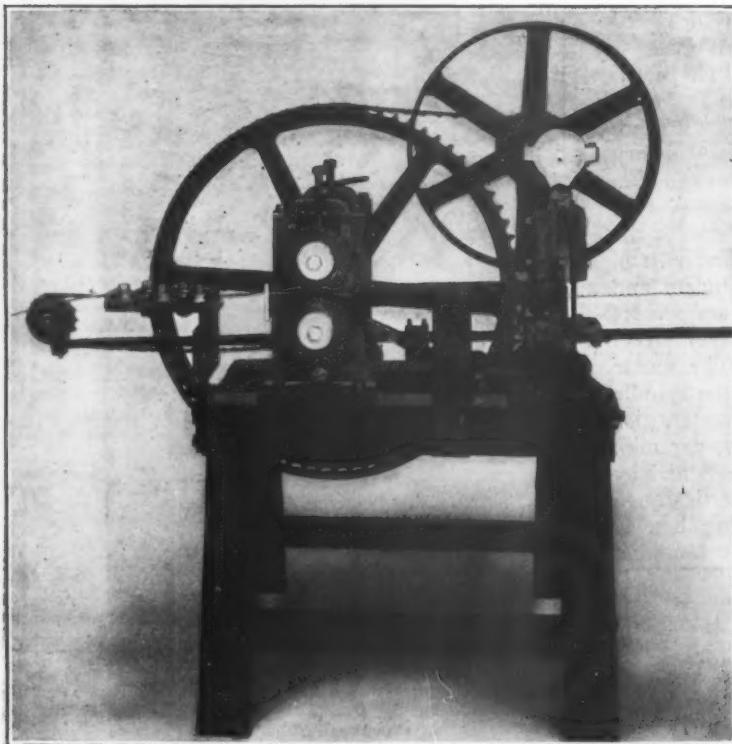
The seat is made of rolled copper, varying from 0.035 to 0.049 in. in thickness, depending on the size of the valve; the shell of the seat is slightly tapered, so that it fits the valve opening tightly after being forced to its position by the pressure of the disk. If the seat becomes worn it can be readily removed and a new one slipped in its place. The disk holder is designed to take either a brass, bronze, copper, white metal, rubber or leather disk. Holders, removed from the valve with copper and rubber disks, are shown in the illustration.

The principal advantage of this valve is that regrinding is not necessary when leaking occurs, as in valves of the ordinary types. The valve will never be removed from the pipe line, and most of the time trouble and cost of repairs ordinarily involved are avoided; it is only necessary to replace the worn parts, which can be done in a very few moments and without the use of any special tools. The cost of the parts is said to be trifling. The valves, disks and seats are of special material to resist wear and withstand pressure. The Nelson Valve Company, Philadelphia, Pa., is the manufacturer of the Huxley valve, which is now about to be placed on the market in an extensive way.

The McCallip Automatic Wire Crimping Machine.

The accompanying illustration shows an automatic wire crimping, cutting, punching and straightening machine built under the McCallip patent by the Diamond Wire Web Company, Columbus, Ohio. This machine, it is stated, is the result of years of development, and contains special features not found in other machines of this type. These are the stopping of the wire during the shearing operation, a vertical shear motion, straightening rolls, and a simple form of construction. One of the fields where this machine is of great use is in the manufacture of wire guards having frames of round rods. These rods are all of different lengths, and when cut from ordinary wire rods, as produced by the mill, cause considerable waste. In this machine, if a suitable pair of feed rolls are substituted for the crimping wheels, coils of rods can be employed instead without wasting either time or material.

This machine is entirely automatic in operation,



The McCallip Automatic Wire Crimping, Cutting, Punching and Straightening Machine, Built by the Diamond Wire Web Company, Columbus, Ohio.

and is a combination of a number, each performing separate operations. The wire is taken from the coil and passed through the small straightening rolls on the left. It then goes to the crimping wheels which feed the wire to the knives where the desired length is cut off. The amount to be cut off is determined by a tripping device attached to the chain running over the sprocket wheel fastened to the lower crimping wheel shaft, and an idler sprocket which is movable on a holding bar. The desired length is secured by taking out or adding links to the chain. The chain trip strikes a lever connected to the clutch of the flywheel on the right, whose shaft has two eccentrics keyed thereto. One of the eccentrics operates a rock shaft, which serves to pull out the crab clutch attached to the large driving sprocket wheel. This instantly stops the crimping wheels, and during this interruption the other eccentric operates the shear and cuts off the wire. When this is done the crab on the rock shaft immediately engages with its mate on the main sprocket wheel, which runs continuously. In this way, it is stated, all displacement of crimps or failure to cut, which sometimes happen with machines equipped with rotary shears, are provided.

The vertical shear mechanism is simple in construction and combines durability with economy of repairs. When not crimping, by simply changing the dies the machine is converted into a punching machine, as provision is made in the plunger to accommodate a punch. If for any reason the change is desired, feed rolls can be substituted for the crimping wheels. The straightening rolls serve to take the coil out of the wire and greatly improve the material when it is used for weaving.

In addition to these features the construction is very simple and affords great strength of operating parts while giving a maximum of service at a minimum of cost. The amount of floor space required is 3 x 2 ft.

Plans for New Passenger Stations in Buffalo.

At a public hearing of the city officials and citizens held in Buffalo February 28, in joint session with the Public Service Commission, called by the Mayor at the request of the commission, the New York Central Railroad Company submitted plans for a new passenger station and terminal which it proposes to build west of Main street, on what is known as "The Terrace" site, in the heart of the city, and also plans for a smaller station at Clinton street, East Buffalo. The plans involve the expenditure of \$7,000,000 to \$9,000,000 for the terminal improvements. Of this amount \$1,000,000 is the estimated cost of the Terrace site passenger station proper, which will be of white sandstone, 480 ft. in length, 120 ft. in width, with a dome 125 ft. high. Outside of the station building will be located canopy covered platforms accommodating 32 tracks, which will enter the station at a grade 17 ft. below the street level, reached by stairways for each platform. The station platforms will have a total capacity of 325 coaches, besides ample capacity for baggage and express cars, for which separate tracks will be provided.

The station will be used by seven other roads—the Lake Shore, Michigan Central, Pennsylvania, Grand Trunk, Buffalo, Rochester & Pittsburgh, Buffalo & Susquehanna and Toronto, Hamilton & Buffalo—as tenants of the New York Central. It is probable that the Wabash will use the station and also the

Lehigh Valley in case the latter does not erect a station of its own, which it has under consideration, at a cost of \$2,000,000, for station and passenger and freight terminals. The Delaware, Lackawanna & Western and Erie companies have agreed to submit plans for new or improved stations to the Public Service Commission, as called for by the commission at the time the Union Station project, to be participated in by all railroads entering Buffalo, was decided to be impracticable.

The carrying out of the New York Central's terminal station plan will involve the abandonment or closing of portions of certain streets by the city; also the abandonment and closing by the State of New York of the southern or city extension end of the Erie Canal for a distance of about four blocks. This portion of the canal is located south of the new entrance of the canal into Buffalo harbor, where the operation of the canal will not be interfered with except possibly to limit canal terminal or storage facilities.

D. A. Hinman & Co., Sandwich, Ill., recently purchased and have taken over the hand bending tool business from Estep & Dolan, who have been manufacturing and selling such tools for the past 10 years.

The Christensen Gasoline Engine Driven Air Compressor.

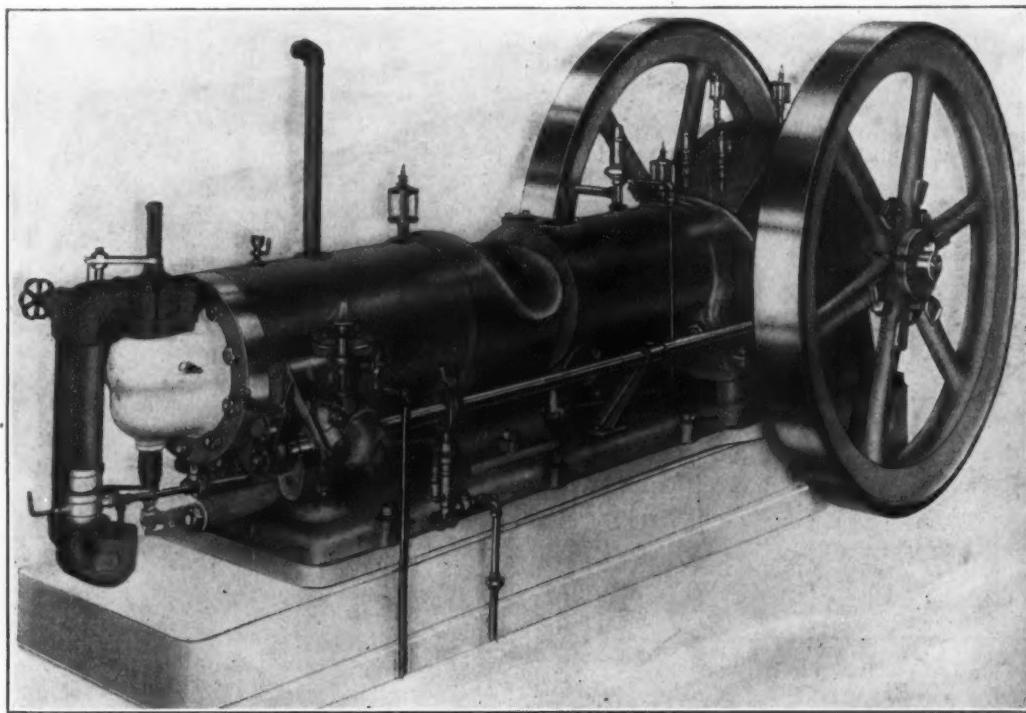
N. A. Christensen, the inventor of the Christensen air brake compressor designed for use in connection with air brakes for street railway use, has perfected a type of compressor driven by a gasoline engine. The compressor is built by the Christensen Engineering Company, Milwaukee, Wis., and, as will be noticed from the accompanying illustration, is mounted on a single heavy bed plate and forms a self-contained unit. When mounted on a truck this type is particularly adapted for construction work, bridge building, pumping water, operating pneumatic tools and other purposes where compressed air is required.

The compressor is of the tandem single acting trunk piston type, and the engine is of the four-cycle hit and miss type. The air cylinder head contains the suction and the discharge valves, which are made of steel and of the standard Christensen type that require no springs to reseat them. The air and gas cylinders

through its head, enters the water jacket on the bottom of the gas cylinder and discharges from its highest point. Three sizes of compressors are built, namely, 60, 110 and 160 cu. ft. If desired these sizes can be arranged in the duplex type, thus making units having double that number of cubic feet of free air per minute.

South and Central American Notes.

SAN JUAN, C. A., February 14, 1910.—The mining of diamonds in Brazil is being helped by Government publicity. The State of Minas Geraes has been known since 1722 as the greatest producer of diamonds in America. Many of the diamonds are yellow, or straw colored, but quantities of the finest specimens in the world have been found. The railroads now building in Minas Geraes will do much to develop the region, especially in transporting machinery, which is badly needed to bring the methods of mining up to date. It is not strange that many Americans are going into



A Gasoline Engine Air Compressor Unit Built by the Christensen Engineering Company, Milwaukee, Wis.

are separate and are secured to their respective supports by heavy bolts.

The suction and discharge valves of the engine are located in the cylinder head and are easily accessible without disturbing any other parts. The carburetor is of a new and improved type and enables easy starting of the engine. For controlling the speed a close regulating ball type governor is employed. One continuous steel piston rod is used and the pistons are all fastened thereto. The crank shaft is an extra heavy forging with liberal wearing surface, and the wrist pin works in a removable bronze bushing.

The frame is of heavy construction and independent of the cylinders. The air compressor and engine are connected by one supporting distance piece. To insure steady running at slow speeds of the compressor large and very heavy flywheels are provided. In the design of this type of compressor special attention has been given to the bearings, all of which are provided with removable bushings of special metal. The replacing of worn out bushings can be effected with little inconvenience and practically no loss of time.

The cylinders of both the air compressor and the gasoline engine are provided with liberal water jackets. The water is admitted around the air cylinder, passes

Brazil, because they are usually liked and well treated by the Brazilians, unless our people go to filibustering, and then a well merited prison awaits them.

Speaking of mining in Spanish-America reminds us that the Government of Colombia is doing its utmost to improve the conditions of the emerald mines in that country. These deposits are at Muso, about 75 miles from the capital—Bogota. It is one of the very few deposits of importance in the world and has produced the finest quality of emeralds for years. But little machinery has penetrated this region.

Colombia is one of the largest and most important countries on the continent, but it needs means of transportation. The Government has offered several railroad grants lately, it is reported, and there is a chance that work will soon be begun between Buenaventura, on the Pacific, and the interior Andes region. On the high plateaus are vast cattle lands and timber and mining regions. Bogota is a beautiful city, with a fine climate. The people enjoy many of the refinements of modern civilization. Cartagena and Savanilla, on the Atlantic (or Caribbean side), are still far from the capital, due to lack of transportation. The Magdalena River is not easy of navigation, even for light draft steamers, and a railroad to the capital would be a boon

to the people at large, but especially to the business community. I am positive that railroad builders, miners and business men generally would find every encouragement in treating with the present Colombian Government.

It is my privilege, through the medium of *The Iron Age*, again to call the attention of our manufacturers, financiers, mining specialists and general business men to the inroads which Germany, England, France and even little Italy are making in the vast "mine" of business, present and future, called Spanish-America. I appeal to the business sense as well as to the patriotism of our people to make more vigorous efforts to get a fair share of the trade of this score of countries to the south of the United States before it is too late.

It must be remembered that the now numerous and steadily growing railroads in Argentina, Brazil and Chile are mostly owned in Europe. So are the copper, nitrate and other mines on the Pacific, in Chile, Peru,

The Crain Combination Woodworker.

To enable a workman to turn out the most work in a given time his tools must be as conveniently disposed as possible and needless steps from place to place avoided. This fact was evidently uppermost in the mind of the designer of the Crain combination woodworker, built by the Buffalo Forge Company, Buffalo, N. Y., for the useless handling of the work with the consequent loss of time, seems to have been eliminated to a great extent. This machine is practically universal and has been developed by an expert woodworker of 30 years' experience to meet the need for a comprehensive and convenient arrangement of the tools most generally employed.

In one machine, occupying a floor space of $3\frac{1}{4} \times 9\frac{1}{2}$ ft., are combined all the operations performed on the lathe, boring machine, drill, band, rip and crosscut saws, planer, sander, sizer, equalizer, shaper and ten-

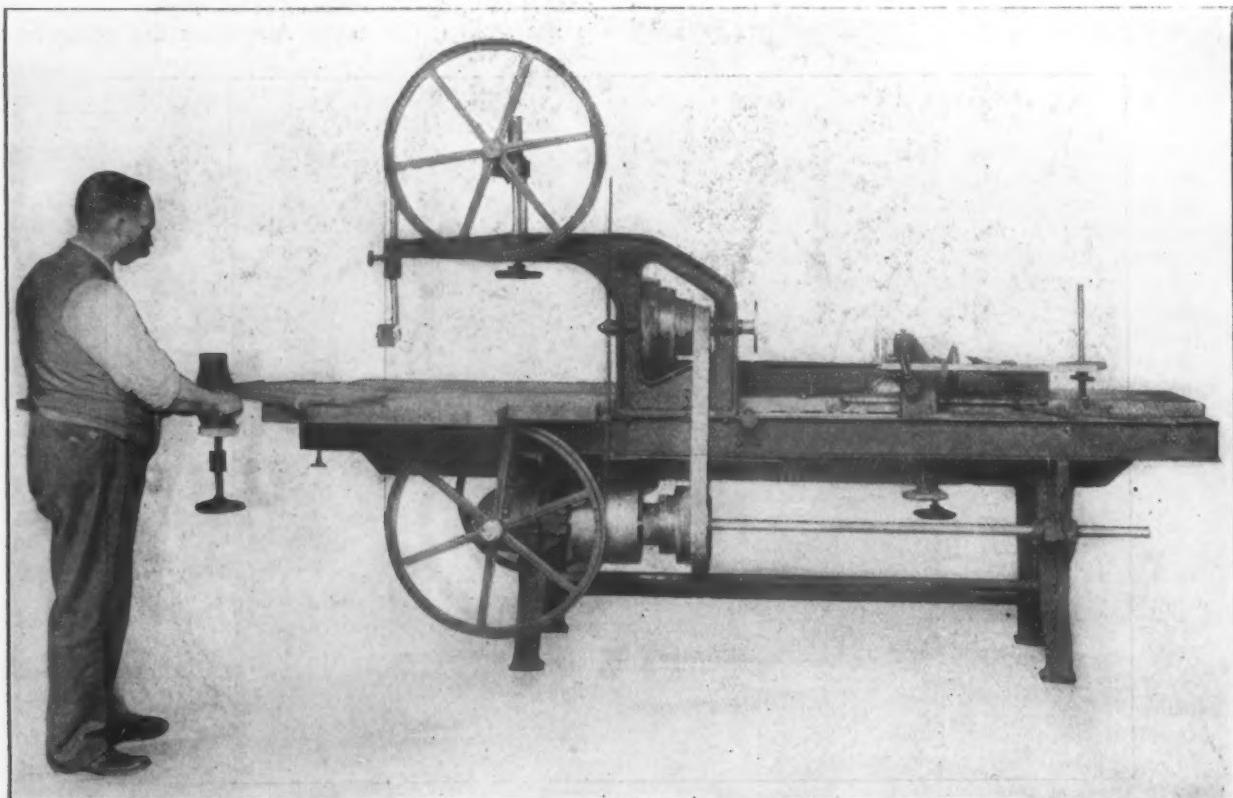


Fig. 1.—The Crain Combination Woodworker. Built by the Buffalo Forge Company, Buffalo, N. Y., Showing the Band Saw in Use Equalizing the Length of Wagon Wheel Spokes.

Bolivia and Ecuador. Europeans never forget, not even for a moment, the importance of Spanish-America. One of the latest manifestations of interest is shown by an issue of the London *Times* devoted entirely to Latin-America. In over 90 pages it handles every phase of affairs in those countries. Financial, manufacturing, political, commercial and historical conditions are all treated by correspondents of experience. In Peru the Lima Street Railway Company is getting under way. Most of the capital, about \$2,000,000, has been subscribed in London, Berlin and Paris, a portion being taken up in New York.

If the revolutions and filibustering expeditions continue much longer in Nicaragua, the country will be ruined for years. Many plantations have already been abandoned.

c.
oner. Each part is used precisely as would be the standard machine built for that particular duty, and no extra attachments are required.

The lathe has a 20-in. swing and will take 40 in. between centers. The headstock is fitted with a cone pulley giving four different speeds. The diameters of these different steps are $5\frac{1}{4}$, $7\frac{1}{2}$, $9\frac{3}{4}$ and 12 in., respectively, and all have a 2-in. face. The lathe part of the machine is shown at the right of the general view given in Fig. 1.

The boring table is fitted with clamps to hold work of any shape firmly in place, and the pieces can be so held that a hole may be bored at any angle up to 45 degrees on either side of the horizontal. Fig. 3 shows the holes for spokes being bored in one-half of a wheel rim. To bring the work to the desired height this table is raised or lowered by the hand wheel adjusting screw immediately below it, which can be seen in this view. The lathe or boring spindle has a tapered socket to accommodate the ordinary taper shank twist drill. This spindle is also threaded so that a face plate, a chuck of any kind, or a tenon can be screwed on. The carriage is equipped with a post for supporting wheels and like-

The Canton Boiler & Engineering Company, Canton, Ohio, has received an order for 10 60-ton steel ladles from the Cambria Steel Company, Johnstown, Pa. This makes 17 60-ton ladles for which the Canton Company has received orders this year, besides several 40 and 30 ton ladles.

articles which can be raised, lowered or tilted so as to give the wheels the required dish when tenoning spokes, a feature certain to be appreciated by the wagon maker. The use of this post is shown in Fig. 4. An adjustable stop is also provided which halts the carriage at any desired point, thus insuring uniformity in the product. As a drill the lathe will bore holes up to 2 in. in diameter in wood and not exceeding $\frac{1}{2}$ in. in wrought iron or steel.

The band saw table is also provided with an adjustable post mounted upon a sliding arm for supporting work that is being equalized as in Fig. 1, where the ends of the spokes are being cut off. The band saw runs on two balanced rubber tired wheels 27 in. in diameter and the power is transmitted from the countershaft through bevel gearing to the lower wheel, which is fitted with a clutch for shutting off the power when

the machine simply by employing easily and quickly changed bits of the required shape.

The machine entire is supported upon heavy cast iron legs, which are rigidly braced so as to give a firm base for the table, which is of $1\frac{3}{4}$ -in. maple. The lathe is supported upon two channel irons firmly secured to the base and generally adding to the stiffness of the entire construction.

The machine requires 4 hp. for its operation, and is regularly equipped for belt drive from an overhead line shaft to the driving pulley located at the left end of the countershaft. The latter is intended to run at a speed of 400 rev. per min., and is equipped with 10-in. tight and loose pulleys having a 4-in. face; the belt shifter is conveniently located under the edge of the table. While this is a rather novel place to have the driving pulley, it is at the same time a very convenient one, as the three

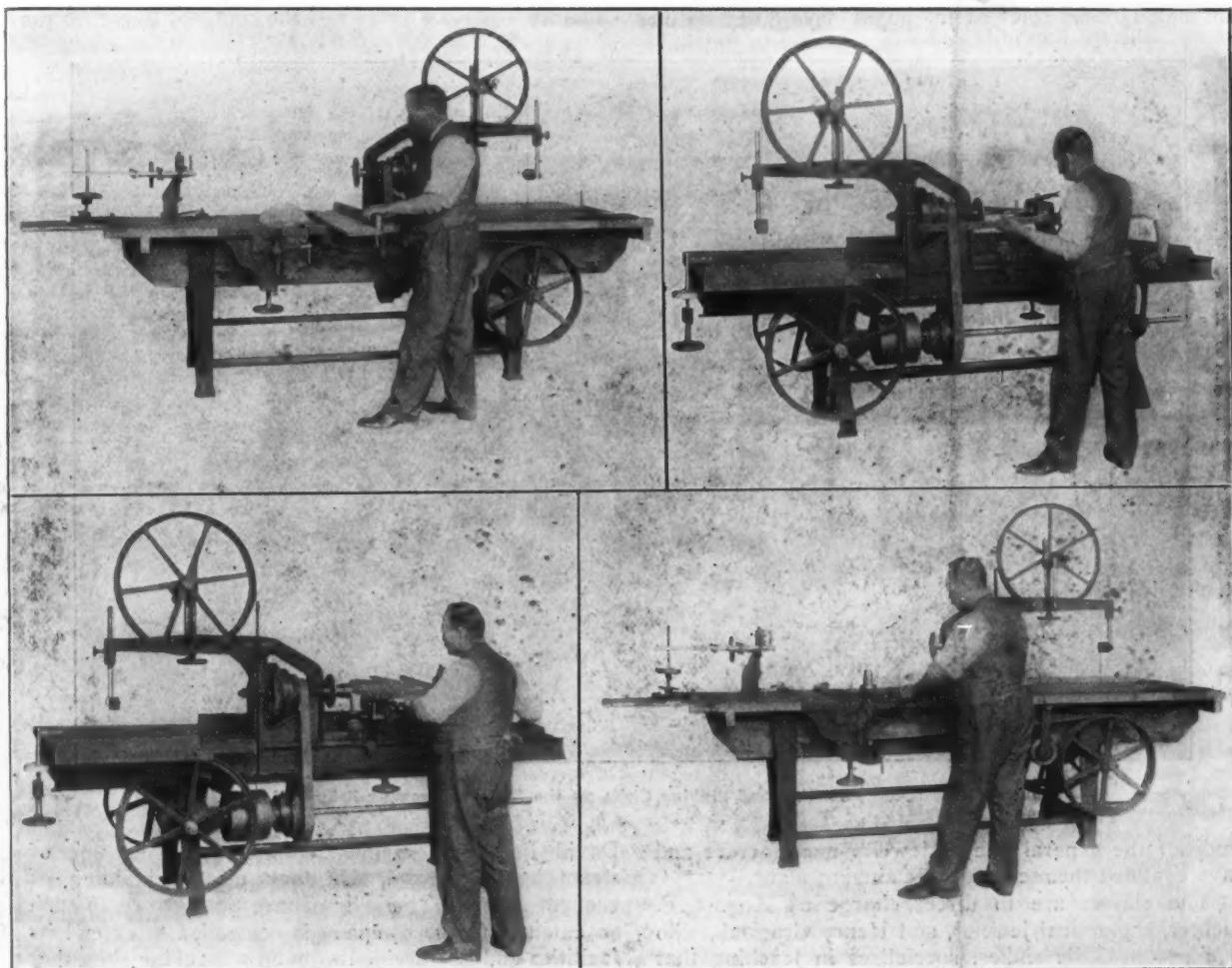


Fig. 2.—Using the Cross-Cut Saw.
Fig. 4.—Tenoning the Ends of Spokes.

Fig. 3.—Boring in the Lathe.
Fig. 5.—The Shaper-Spindle in Use.

the saw is not in use. The principal danger of accidents due to the moving saw is thus eliminated. The saw guide is adjustable and can be raised to accommodate work 12 in. thick. The saw arbor on the other side of the machine from the lathe, shown in Fig. 2, will take rip or crosscut saws not exceeding 12 in. in diameter. The table is fitted with a cutoff gauge which can be adjusted to guide the work for cutting at any angle up to 45 degrees, and also has an adjustable guide for sizing, edging, &c.

The planer head is pivoted and can be used either vertically, as in Fig. 5, or horizontally, or at any intermediate angle. Raising or lowering the head is effected by the hand wheel adjusting screw directly below it, and bits of any shape and up to 6 in. wide can be used. An adjustable guide forming part of the planer table is used to direct the work as it passes through the machine. Jointing, chamfering, rounding and cutting moldings and dadoes can also be done on this part of

pulleys that it is designed to supply power to are in the immediate vicinity. The stepped cone pulley for the lathe and drill spindle is directly alongside, while the bevel gearing for driving the two saws is on the opposite side and also close by. These gears transmit the power from the countershaft to the cross shaft, which is provided with clutches to operate the lower band saw wheel or the large pulley at the opposite end, which by a belt passing over the small idler drives the saw arbor or the shaper spindle as shown in Figs. 2 and 5, respectively.

The new tin plate plant of the Phillips Sheet & Tin Plate Company, at Weirton, W. Va., has been put in operation. It contains 10 hot mills and 10 stands of cold rolls. The hot mills are operated by a 32 and 34 by 60 in. twin tandem compound engine, direct connected, five mills being on each side.

Free Instruction in Die Sinking.

The Fawcett Drawing School of Newark, N. J., is the only public institution in the country where die cutting and sinking is taught. The die making class, which has been in existence about two years, was organized as a branch of the general jewelry class of about 70 scholars, who are taking up the study of jewelry manufacture. About 40 pupils are also studying the die sinking branch of the business. The pupils are mainly young men and women, with the first in the majority. Occasionally older men who wish to learn the die sinking business take advantage of the course. An excellent set of die sinking tools is furnished to each pupil and the steel used in the work is sold to the scholars at a minimum price. A drop hammer forms part of the shop equipment, together with a small hardening furnace. The pupils are required to make their own designs usually. Since starting the die making class some of the pupils have given up the

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The Buffalo Foundry & Machine Company.

Orders have recently been placed by the Buffalo Foundry & Machine Company, Buffalo, N. Y., for buildings, equipment, &c., required for its large new machine shop. This company has been widely known for its exceptional foundry plant and its ability to produce castings weighing as heavy as 200 tons, the claim being made that it has the largest and best equipped general foundry in the country. While the machine shop has been much larger and better equipped than the average, yet it was not large enough to balance the foundry. Several years ago the company absorbed the



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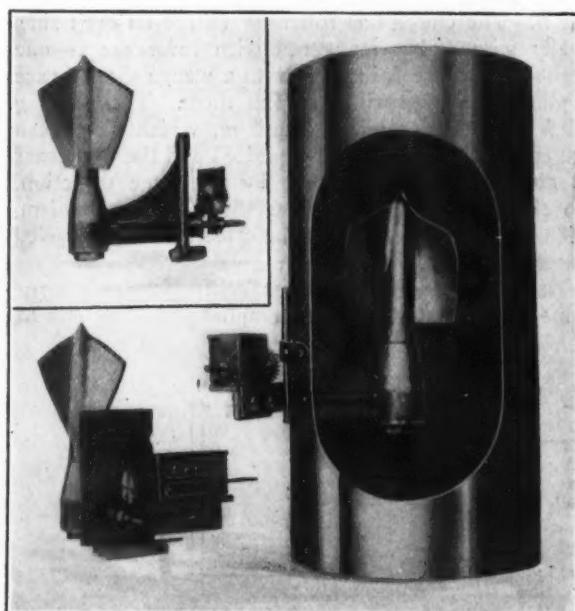
David Boll Engineering Company, with its line of steam hammers, and also took up the building of vacuum dryers. These lines have now grown to such an extent that the company is compelled to extend its facilities and has decided to build a machine shop that would be as well equipped in its line as the foundry.

The new machine shop will be built north of the present foundry, on property lying between Scajquaqua Creek and the New York Central Belt Line, which railroad connects it with all the various lines in Buffalo. Approximately \$200,000 will be spent at the present time on the machine shop. The building will be of steel and concrete construction, with traveling cranes in all the bays and galleries. A special study has been made to eliminate all hand handling. The cranes will be of a capacity to lift easily individual pieces weighing as much as 200 tons each. Orders have been placed for exceptionally large machine tool equipment, all having been ordered specially, so as to obtain the highest production and get an exceptionally large range of work. All the tools will be motor driven, the motors being twice the size ordinarily used on the same machines. The entire plant will be operated by Niagara Falls power. The company is about to take up several additional lines of manufacture and will also continue to make a specialty of general jobbing machine work.

The Havard Coal Meter.

An instrument for measuring coal or any other granular material, such as grain, coffee, rice, sand, gravel and like substances, is the Havard coal meter, which is the invention of Oliver D. Havard, Scranton, Pa., and made by O. D. Havard & Co. of that city. The objects which the meter is designed to fill are to provide a device which can be inserted in a tube through which the material to be measured is passing, and to be actuated by the movement of this material, so as to register the amount passing through the tube in a given time. At the same time the device must offer a minimum obstruction to the passing material, and contain the fewest possible parts, so assembled as to be protected from injury or wear.

The working parts of the meter are supported by a single pedestal which comprises a base adapted to fit within an opening formed in the wall of the conduit, and having a flange which overlaps the opening



A Meter for Recording the Quantity of Coal or Similar Material Passed, Made by O. D. Havard & Co., Scranton, Pa.

and enables the base to be secured to the conduit by rivets or other fastening devices. It will be noticed from the small view in the upper left corner of the accompanying illustration that the base of the pedestal is extended in the length of the conduit for a considerable distance to afford a firm support. The pedestal tapers in width gradually from the base on the upper side.

One of the most important features of the meter consists in forming the pedestal so that it will offer the least resistance to the passage of material through the tube. With that end in view the pedestal is designed with an enlarged circular central portion, with wings projecting therefrom in the plane of the axis of the pedestal. The edges of these wings are tapering or wedge shaped, so as to divide the material as it passes through the tube. The center of the enlarged portion is bored to receive a shaft which extends from the registering mechanism on the outside of the tube to the inner end of the pedestal. An arm extends upward from the inner end of the pedestal and is coincident with the axis of the tube. An opening in the center of this arm contains a rod which connects through bevel gearing at its lower end with the rod passing through the pedestal. Attached to its upper end are the vanes which operate the device.

In operation, material passing through the tube causes the vanes to revolve. This causes the shaft to which they are attached to rotate and operate the registering mechanism through the rod passing through

the pedestal and the gearing connected thereto. In this way the amount of material passing the meter in a given time will be indicated by the registering device, which is suitably calibrated in tons, bushels or any other desired unit.

All the gears and other working parts are entirely inclosed and none come in contact with the material being measured. A large clearance space is left on either side of the meter for the material to pass through freely. The obstruction to the flow of material is thus reduced to a minimum and the meter coming in contact with only a portion of the material acts as a proportional meter and its movement is proportional to the total amount of material passing.

Tests made of these meters show that it is very consistent in the measurement of coal. The common practice is to calibrate the meters within 1 per cent. of the scale weight, and those now in use have retained their calibration very well. For use in boiler rooms or other places where a continuous measure of coal is desired, the meters can be calibrated to eliminate moisture, and thus give the engineer a more accurate measure of the amount of actual coal than a scale weight.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club in that city on the evening of March 2, President Thomas Devlin occupying the chair. The attendance of local and nearby foundrymen was the most representative for a long time, attention being focused on the labor situation, as well as the excellent paper prepared by S. S. Knight of the Chester Steel Castings Company, Chester, Pa., on "Segregation Phenomena in Steel Castings," which was illustrated by numerous lantern slides. This paper was printed in full in *The Iron Age* of March 3.

After the transaction of routine business, the matter of the proposed sympathetic strike on the part of local union labor, in connection with the strike of certain employees of the Philadelphia Rapid Transit Company, was discussed at length and the following resolutions, prepared by a committee composed of E. E. Brown, W. S. Hallowell and H. L. Haldeman, appointed by the president, were presented and after further discussion adopted:

Whereas, There now exists a strike of certain employees of the Philadelphia Rapid Transit Company; and

Whereas, It is currently reported that, unless this strike be settled on or before March 5 there will be declared a general sympathetic strike of all union labor in the city of Philadelphia, thereby calling from their occupations many thousands of union workmen; and

Whereas, Such sympathetic strike would be manifestly unjust, unwise and unpatriotic, causing suffering and distress to all workmen, union and nonunion, to all business interests of every character, to the citizens generally, as well as to the good name of the city of Philadelphia; therefore, be it

Resolved, by the Philadelphia Foundrymen's Association, in meeting assembled, That the prospect of such sympathetic strike be and hereby is deplored, and that all good citizens are urged to oppose and disown such action by every just and proper means in their power, for the reason that not only are violence, destruction of property and sacrifice of human life likely to result, but that the sympathetic strike opposes American ideals of free government and brings about a condition where the ordinary processes of law and order are set at defiance and the citizens not protected in the exercise of their constitutional rights.

The general foundry situation was discussed at length. While the demand for castings was reported in many lines to be quite good, others had not been favored with any great amount of new business. Better weather conditions, it was stated, would, no doubt, bring about a more active demand.

The No. 2 blast furnace of the Dunbar Furnace Company, Dunbar, Pa., had made 256,781 gross tons of pig iron up to March 1 on its present run. The total number of casts was 6783.

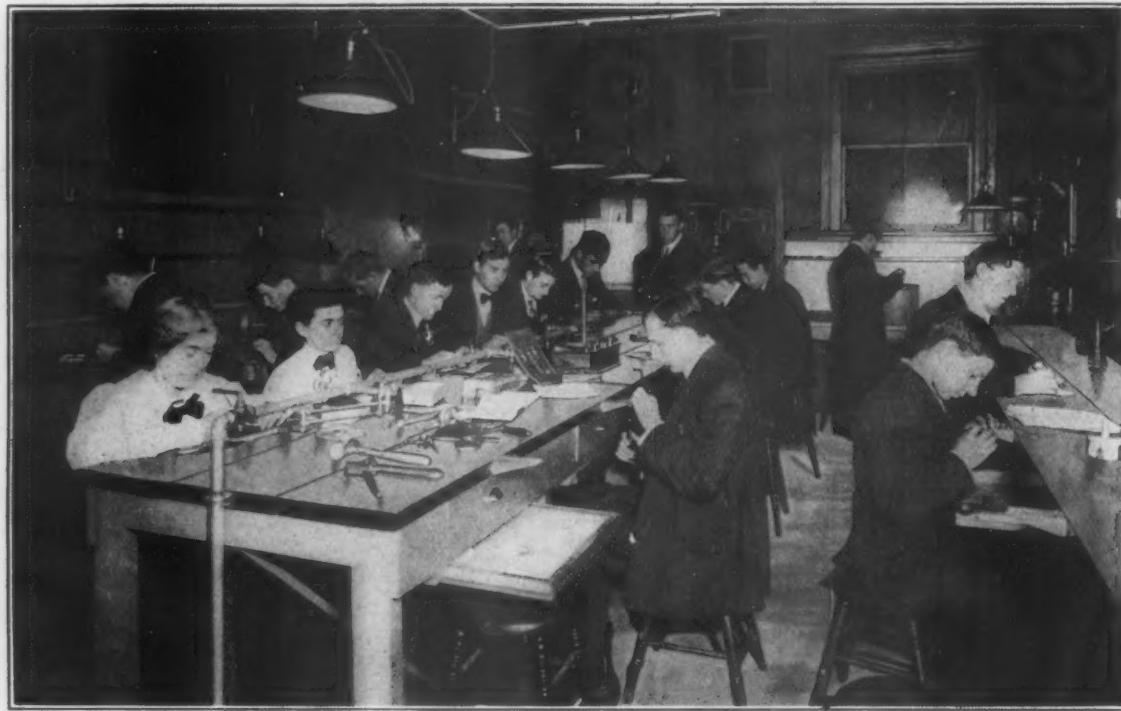
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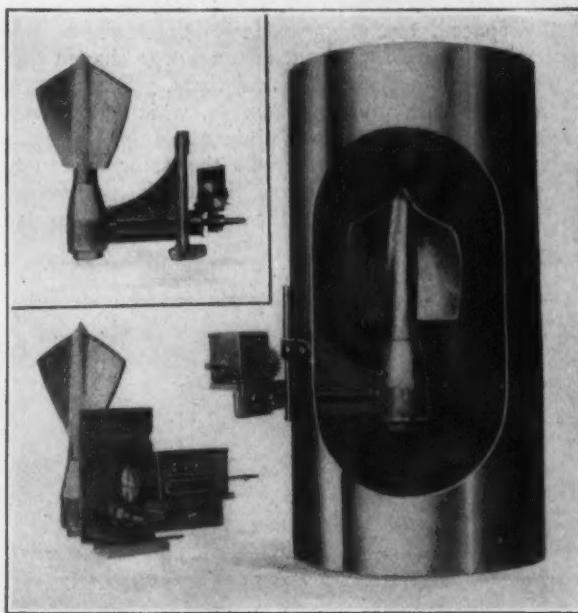
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and enables the base to be secured to the conduit by rivets or other fastening devices. It will be noticed from the small view in the upper left corner of the accompanying illustration that the base of the pedestal is extended in the length of the conduit for a considerable distance to afford a firm support. The pedestal tapers in width gradually from the base on the upper side.

One of the most important features of the meter consists in forming the pedestal so that it will offer the least resistance to the passage of material through the tube. With that end in view the pedestal is designed with an enlarged circular central portion, with wings projecting therefrom in the plane of the axis of the pedestal. The edges of these wings are tapering or wedge shaped, so as to divide the material as it passes through the tube. The center of the enlarged portion is bored to receive a shaft which extends from the registering mechanism on the outside of the tube to the inner end of the pedestal. An arm extends upward from the inner end of the pedestal and is coincident with the axis of the tube. An opening in the center of this arm contains a rod which connects through bevel gearing at its lower end with the rod passing through the pedestal. Attached to its upper end are the vanes which operate the device.

In operation, material passing through the tube causes the vanes to revolve. This causes the shaft to which they are attached to rotate and operate the registering mechanism through the rod passing through

the pedestal and the gearing connected thereto. In this way the amount of material passing the meter in a given time will be indicated by the registering device, which is suitably calibrated in tons, bushels or any other desired unit.

All the gears and other working parts are entirely inclosed and none come in contact with the material being measured. A large clearance space is left on either side of the meter for the material to pass through freely. The obstruction to the flow of material is thus reduced to a minimum and the meter coming in contact with only a portion of the material acts as a proportional meter and its movement is proportional to the total amount of material passing.

Tests made of these meters show that it is very consistent in the measurement of coal. The common practice is to calibrate the meters within 1 per cent. of the scale weight, and those now in use have retained their calibration very well. For use in boiler rooms or other places where a continuous measure of coal is desired, the meters can be calibrated to eliminate moisture, and thus give the engineer a more accurate measure of the amount of actual coal than a scale weight.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club in that city on the evening of March 2, President Thomas Devlin occupying the chair. The attendance of local and nearby foundrymen was the most representative for a long time, attention being focused on the labor situation, as well as the excellent paper prepared by S. S. Knight of the Chester Steel Castings Company, Chester, Pa., on "Segregation Phenomena in Steel Castings," which was illustrated by numerous lantern slides. This paper was printed in full in *The Iron Age* of March 3.

After the transaction of routine business, the matter of the proposed sympathetic strike on the part of local union labor, in connection with the strike of certain employees of the Philadelphia Rapid Transit Company, was discussed at length and the following resolutions, prepared by a committee composed of E. E. Brown, W. S. Hallowell and H. L. Haldeman, appointed by the president, were presented and after further discussion adopted:

Whereas, There now exists a strike of certain employees of the Philadelphia Rapid Transit Company; and

Whereas, It is currently reported that, unless this strike be settled on or before March 5 there will be declared a general sympathetic strike of all union labor in the city of Philadelphia, thereby calling from their occupations many thousands of union workmen; and

Whereas, Such sympathetic strike would be manifestly unjust, unwise and unpatriotic, causing suffering and distress to all workmen, union and nonunion, to all business interests of every character, to the citizens generally, as well as to the good name of the city of Philadelphia; therefore, be it

Resolved, by the Philadelphia Foundrymen's Association, in meeting assembled, That the prospect of such sympathetic strike be and hereby is deplored, and that all good citizens are urged to oppose and disown such action by every just and proper means in their power, for the reason that not only are violence, destruction of property and sacrifice of human life likely to result, but that the sympathetic strike opposes American ideals of free government and brings about a condition where the ordinary processes of law and order are set at defiance and the citizens not protected in the exercise of their constitutional rights.

The general foundry situation was discussed at length. While the demand for castings was reported in many lines to be quite good, others had not been favored with any great amount of new business. Better weather conditions, it was stated, would, no doubt, bring about a more active demand.

The No. 2 blast furnace of the Dunbar Furnace Company, Dunbar, Pa., had made 256,781 gross tons of pig iron up to March 1 on its present run. The total number of casts was 6783.

The Duenkel Reciprocating Meter.

A meter for accurately registering in feet the total travel of reciprocating motions and one particularly adapted for pumps, engines and elevators is being manufactured by the Mechanical Instrument Company, 120 Liberty street, New York. As it gives an accurate record at all times of the total distance traveled by the



Fig. 1.—The Positive Drive Type of the Duenkel Mico Reciprocating Meter Made by the Mechanical Instrument Company, New York.

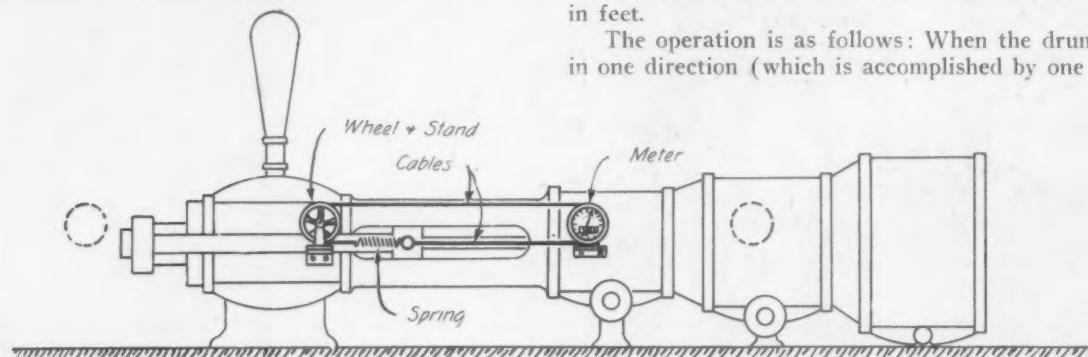


Fig. 2.—Diagram of the Application of the Meter to a Steam Pump.

piston, the meter can be used to check the actual life of different piston rings, piston rods, packings, pump valves, lubricants, elevator cables and various other appliances used on reciprocating machinery, as well as the amount of power consumed where the duty performed is constant.

Fig. 1 shows the meter and Fig. 2 its application to a pump whose stroke does not exceed 48 in. A $\frac{1}{8}$ -in. flexible bronze cable is fastened to a drum on the meter, passes around a small stationary wheel, and is hooked to a spring, which is in turn attached to the pump crosshead. The function of the spring is to take up any slack in the cable, and its expansion and contraction does not affect the distance traveled by the crosshead and registered on the dial. Another cable leads from the crosshead to the drum, and while the first cable winds on the second unwinds. For strokes longer than 48 in., as, for instance, for registering the travel of an elevator, a traction device of three pulleys is employed. These are arranged so that one pulley is the drum at the back of the meter and has three half traction turns of the cable wound around it. Two of these half turns pass around a fixed idler located adjacent to and below the meter, while the third is wrapped around a combination pulley and counterweight at the bottom of the elevator shaft. This furnishes the required tension for the cable. Attached to this cable is an arm which can be connected to either the car or the elevator machine and operates the meter.

The meter may be located either right or left handed, with the cable leading either from the top or bot-

tom. The dotted circles in Fig. 2 indicate other possible positions of both the meter and the stationary wheel. If it is desired to locate the meter at a point distant from the pump or engine, guide pulleys for the cable may be located at these points. The installation just described is what is termed a positive return meter, but there is another—viz., the spring return—working on the same principle as a steam engine indicator, with a single cable from the drum to the crosshead.

Fig. 3 is a sectional plan view of a meter with the spring return attachment. Back of the grooved drum *a*, around which the cable is wound, is a box, *b*, 6 in. in diameter. In the box is a spring, *c*, with the outer end fastened to the box and the inner end to the collar *d*, that is forced against the drum by the nut on the end of the shaft *e*, the spring and drum thus moving together. The spring is of tempered phosphor bronze 16 ft. long and 1 in. wide. Steel ones were at first experimented with, but were not found satisfactory. To the shaft *e* is keyed a ball clutch, *f*, one side of the face gripping the under side of gear *g* and the other gear *h*. The clutch has rollers, *k* (three on each side, equally spaced, but staggered with reference to one another), that are forced out into a wedge shaped race by plungers with springs behind them. The gears *g* and *h* mesh with pinions *l* and *m*, which also mesh with each other; thus the two pinions and the two gears are always running together in the same direction. The shaft of pinion *m* drives the clock mechanism, which indicates the distance the crosshead has traveled in feet.

The operation is as follows: When the drum turns in one direction (which is accomplished by one end of

the cable being fastened to the drum and the other to the crosshead), the clutch, by means of the rollers, will grip the shoulder of the gear *g*, turning it in the same direction, while gear *h* is running free in the opposite direction. On the reversal of the drum, caused by the change in the direction of the stroke of the crosshead, gear *h* is gripped and *g* runs free.

The spring return type differs from the positive

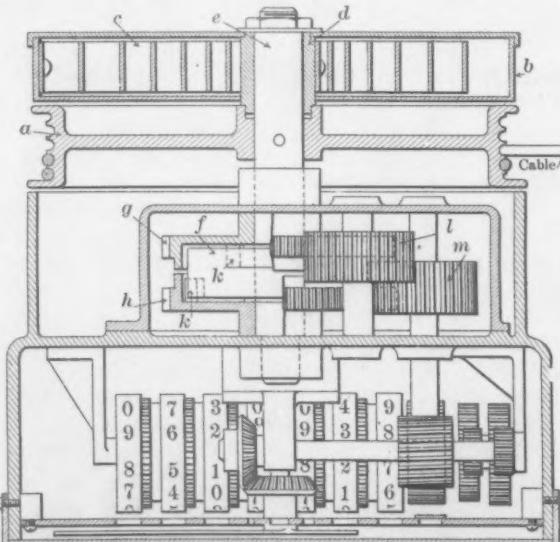


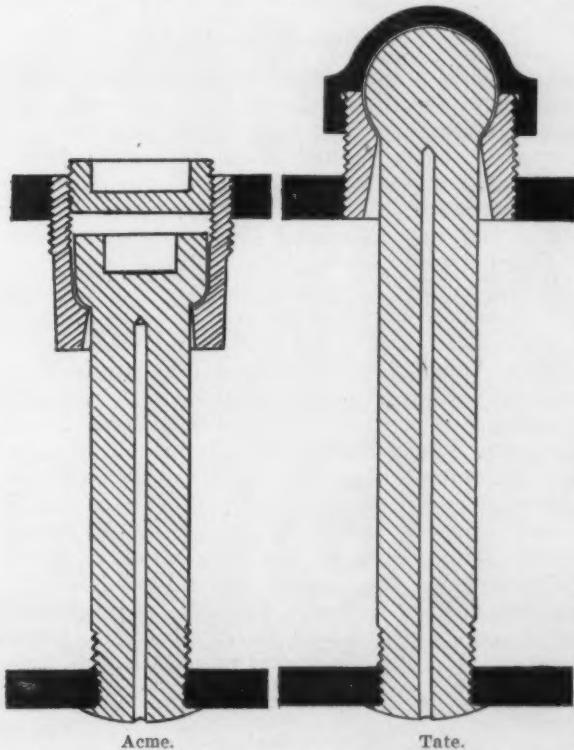
Fig. 3.—Sectional Plan View of the Spring Return Type of the Meter.

return meter, shown in Fig. 1, only in the addition of the box and the spring. Any number of strokes or fractions thereof are added and recorded. The hand always rotates in a clockwise direction and one revolution represents 10 ft. of piston travel. The dial is graduated in divisions, each of which represents 0.05 ft. The lower row of eight figures gives the total linear feet traveled and repeats at 100,000,000.

The meter when fitted to pumps is far superior to the ordinary stroke or revolution counters, as they only indicate reversals, irrespective of the length of the stroke. On duplex pumps the meter shows which side is traveling the greatest distance or is doing the most work and gives notice if the valves have not been properly set. From the readings in linear feet the actual number of gallons of water and the volumes of gas delivered by pumps and compressors can be calculated. This is important for boiler feed pumps, where an accurate record can be obtained of the maximum weight or gallons of water evaporated per pound of fuel. By connecting the meter to the traveling frame of a geared hydraulic elevator, the gallons of water consumed per car mile can be ascertained.

Flexible Staybolts With Hollow Stems.

At the last two or three Master Mechanics' and Master Boiler Makers' conventions there was considerable discussion as to the best way to test flexible bolts, or how to tell when they are broken. The following is the opinion of John Hickey, for many years superin-



Two Styles of Flexible Bolt Made Up with Hollow Stems to Give Warning If Broken.

tendent of motive power of the Northern Pacific Railroad and later master mechanic of the Denver & Rio Grande Western Railroad:

It could be stated that the purpose of the inventors of flexible bolts to arrange a staybolt attachment at the outer sheet, which would, without straining the metal, respond freely to the expansion and contraction movement of the inner or fire sheet, is commendable, but we must not overlook the fact that any influence interfering with or retarding the free movement of the head would immediately convert it to the condition of a rigid stay. In other words, the vibratory strain would be thrown on the metal as in the ordinary staybolt.

The formation of scale or the precipitation of other

impurities in the water is liable at any time to interfere with the free action of the flexible head, and thus bring about rigid conditions which it is desirable to avoid.

It is, therefore, quite as necessary that the flexible stay be covered by regulation staybolt inspection, the same as the solid bolt, and as a measure of safety this point should not be neglected.

It is impossible to detect broken flexible bolts by hammer sound, owing to the style of the flexible head attachment to the outer sheet. This leads to the necessity of removing the caps covering the heads in order to determine those actually broken. Removing and replacing those parts for the purpose of inspection means much labor and expense, and is likely to cause delay to power. To avoid this trouble the hollow staybolt iron is recommended to be used for the stems of the flexible staybolts.

Both service and laboratory tests have repeatedly demonstrated that the hollow rolled iron possesses over 50 per cent. greater endurance than solid iron, and if introduced in connection with the flexible head, it will not only add to the life of the stay, but will in itself completely solve the question of inspection.

With the use of the hollow stem a fully broken stay will not only be readily disclosed, but a fracture amounting to one-half its diameter will promptly make itself known.

The Detroit Industrial Exposition.

Detroit, Mich., is to hold a great industrial exposition under the auspices of the Board of Commerce, June 20 to July 6. The exposition grounds will be on the Detroit River, where a huge building will be erected and used in conjunction with the Wayne Pavilion. The display promises to be one of the most unique and extensive outside of world's fairs. It is claimed that 100,000 different articles are manufactured in the 3000 shops of the city, the products ranging from pins to steamships and including a variety that is rivaled by the outputs of few American cities. Not only the products of Detroit's factories will be shown, but also the processes. It is the purpose of the exposition to teach the world the variety, extent and quality of the city's products.

In one building the general departments will be machinery, metal products, paints, electricity, building supplies, rubber, leather and paper products, drugs and chemicals, tobacco, food products, novelties and specialties, while in the other building will be automobiles and accessories, wagons and carriages, furniture, textiles, boots and shoes, house furnishings, jewelry and scientific instruments.

Detroit has planned its exposition on a liberal scale, the committee in charge consisting of 275 of the leading manufacturers, representing a capital of \$150,000,000.

The Victor Safe & Lock Company, Cincinnati, Ohio, is erecting a plant at Norwood, Ohio, which comprises the following structures: Main erection shop, 100 x 600 ft., two stories; administration building, 50 x 100 ft., two stories; building for grinding purposes, 80 x 180 ft.; building for finishing work, 180 x 200 ft., and four smaller buildings, with a separate power building equipped with apparatus capable of generating 500 hp. The entire group of buildings will contain over 200,000 sq. ft. of floor space for manufacturing purposes.

The Consumers' Cooler Company, manufacturer of Useit coolers, has moved its general office and factory to Michigan City, Ind., where it has erected a building with three times the capacity of the Chicago factory.

Metal Trades Association Meetings.

Cincinnati Branch.

On Thursday evening, March 3, in connection with a dinner at the Business Men's Club in Cincinnati was held the annual meeting of the Cincinnati Branch of the National Metal Trades Association. John W. Niel, the president, reviewed the year's activities, recalling that the association had gone on record as opposing the merger of the National Founders' Association and the National Metal Trades Association; had worked for the maintenance of equitable freight rates and consolidated carload lots; was committed to the extension of industrial education in all its ramifications; and to the installation of apparatus for testing laboratories; besides numerous plans for the betterment of the thousands of employees in the Cincinnati district.

Secretary John M. Manley in his report covered the year's progress, and noted that a 50 per cent. increase in membership over that of 1907 was sufficient proof of the worth of the organization to the trade. The present, he said, is a peaceful and healthy time in the industrial world. The number of operatives employed by the local members had increased 40 per cent. in a year. Of educational work, he said:

Through the persistent and earnest work of a determined set of men the first continuation school in America was started in Cincinnati September 1, 1909, barely six months ago. This is construction work of the broadest and most important character, and is perhaps not so apparent to us as to people of other sections who are facing now the problems in the solution of which this association has made such admirable progress. The continuation schools are the logical and natural outgrowth of Professor Schneider's co-operative courses in engineering, both of which have been made possible by the splendid support of metal trades associations. Four years ago a sight so full of promise as 225 university students working in our factories and 200 apprentices attending continuation schools was beyond the dreams of the most sanguine enthusiasts. . . . When the history of industrial education in America is written, you men of the Cincinnati Metal Trades Association who have given of your time and your talents so fully to push the co-operative and continuation school idea, will have a conspicuous place in its pages.

Statistics of the association show that over 9000 applied for positions at the Cincinnati office during the year, and included in this number were some of the highest salaried men in the trade. Referring to the unpleasant experiences of members of the Cincinnati branch through advertisements in Cincinnati newspapers for skilled mechanics to go to outside points, the secretary noted that through the exercise of official diplomacy and a mutual recognition of certain rights these advertisements had been discontinued or largely curtailed.

Officers for the ensuing year were elected as follows: President, Richard K. Le Blond, R. K. Le Blond Machine Tool Company; vice-president, E. H. Hargrave, president Cincinnati Tool Company; treasurer, Henry Ritter, Lunkenheimer Company; secretary, Robert S. Alter, secretary and manager of publicity department American Tool Works Company; executive committee: P. C. Geier, Cincinnati Milling Machine Company; S. P. Egan, J. A. Fay & Egan Company; B. B. Quillen, Cincinnati Planer Company.

The new president, Mr. Le Blond, being absent from the city, Mr. Hargrave, vice-president elect, announced that the new board would work just as hard as the retiring one. The president, vice-president and secretary will constitute the district board to represent Cincinnati in the national organization.

George K. Elliott, chief chemist and metallurgist of the Lunkenheimer Company, was the first of the guests to speak, giving a stereopticon talk on "The Structure and Adaptability of the Iron Alloys." It was admirably calculated to interest manufacturers and foundrymen present. He took up the chemical

constituents of wrought iron, steel, cast steel, semi-steel and malleable cast iron, devoting himself particularly to cast iron. He considered what is reasonable to expect of that metal in its common utilization.

J. Howard Renshaw, instructor in the recently established system of continuation schools, read an excellent paper on the subject. He described the new school and its plan, which permits of the attendance of apprentices for a certain term at the expense of the manufacturer.

Stanley E. Bowdle, a young attorney, who was a machinist at the Cramp shipyards, traced the origin and development of the machine tool, referring to the lathe as the "king" of the tool family and to the planer as "the grandfather of the milling machine." He said there are 43 large tool manufacturing plants in the Cincinnati field whose product could be marked "the best in the world."

M. Cokely of the Lima Locomotive & Machine Company, Lima, Ohio, made a strong exposition of the underlying principles that regulate capital and labor and gave some good advice on handling operatives.

B. B. Quillen, member of the Administrative Council of the National Metal Trades Association, spoke of the duties of the employer to the employee.

Carrying out the custom of the Cincinnati Association, President Niel designated Wood Walter of the Cincinnati Milling Machine Company to express the thanks of the organization to the guest speakers. Mr. Walter made such a signal success as association valedictorian that he is probably a fixture in that important office.

Worcester Branch.

The annual meeting of the Worcester Branch, National Metal Trades Association, was held in that city March 4, the important manufacturing centers of Worcester County, including the city of Fitchburg, being well represented. Albert E. Newton, Prentice Bros. Company, Worcester, was elected president; John W. Higgins, Worcester Pressed Steel Company, Worcester, vice-president; A. W. Beaman, Stockbridge Machine Company, Worcester, treasurer. The Executive Committeemen elected for two years are: Clarence W. Hobbs, Hobbs Mfg. Company, Worcester; George I. Alden, Norton Grinding Company and Norton Company, and George F. Brooks, Harrington & Richardson Arms Company, Worcester; for one year, A. W. Whitcomb, Whitcomb-Blaisdell Machine Tool Company, Worcester. The other members of the committee to serve another year are: Channing Wells, American Optical Company, Southbridge, and H. B. McDonald, Simonds Mfg. Company, Fitchburg. Robert Wuest, commissioner of the National Metal Trades Association, delivered an address. The association declared itself as favoring the advancement of industrial school education, the half-time system as practiced at Fitchburg, and the combination system as carried out in Cincinnati.

Boston Branch.

The annual meeting of the Boston Branch, National Metal Trades Association, was held at Young's Hotel, Boston, March 10, with the usual large attendance. E. P. Robinson, Atlantic Works, Boston, was elected president; Winslow Blanchard, Blanchard Machine Company, Cambridge, vice-president; D. D. Russell, James Russell Boiler Works, South Boston, treasurer; Fred F. Stockwell, Barbour-Stockwell Company, Cambridge, to the Executive Committee to serve until 1911; George F. Lawley, George Lawley & Son Corporation, South Boston, and Martin McLaughlin, Geo. T. McLaughlin Company, Boston, to the Executive Committee to serve until 1912. M. H. Barker, American Tool & Machine Company, Boston, has been made an honorary member of the committee. These officers, with H. I. Illingworth, Boston Machine Works, Lynn, who serves until 1911, constitute the Executive Committee of the branch.

Reports of officers were accepted, and interesting speaking followed.

CLEVELAND BRANCH.

The annual meeting and banquet of the Cleveland Branch of the National Metal Trades Association was held at the Cleveland Athletic Club March 3. About 70 members were present, and the meeting was declared to have been the most enjoyable ever held by the Cleveland Branch. Following the banquet a business session was held, which began with the presentation of satisfactory reports for the year by L. D. Weaning, president; C. J. Snow, treasurer, and Philip Frankel, secretary. The secretary reported an increase of four in membership for the year. New officers were elected as follows: President, C. O. Bartlett, C. O. Bartlett & Snow Company; vice-president, Fred R. White, Baker Motor Vehicle Company; treasurer, C. J. Snow, Bruce-Macbeth Engine Company; Executive Board: The President, vice-president, and treasurer; W. D. Sayle, Cleveland Punch & Shear Works Company; George J. Dunham, Royal Tourist Car Company; T. P. Robbins, Cleveland Hardware Company; J. H. Champ, Bishop & Babcock Company, and James Foster, Hydraulic Pressed Steel Company.

H. W. Avery as toastmaster introduced the speakers, who were: Howard P. Eells, president of the National Metal Trades Association; Myron T. Herrick, formerly Governor of Ohio; Rev. G. Frederick Williams, J. P. Dayley, attorney for the Cleveland Branch, and C. O. Bartlett, the new president. President Eells spoke on the work of the national organization, and Attorney Dayley on the corporation income tax and other legal questions. The following new members added to the Cleveland Branch in the year were: Diebold-Peters Company, Royal Tourist Car Company, Elwell-Parker Electric Company and the Van Dorn & Dutton Company.

NEW YORK AND NEW JERSEY BRANCH.

The annual meeting of the New York and New Jersey Branch of the National Metal Trades Association was held on March 7, at the Machinery Club, New York. Preceding the meeting a luncheon was served to the members and their guests. The following officers were elected for the ensuing year: President, Stevenson Taylor, Quintard Iron Works; vice-president, Michael Fogarty; treasurer, L. A. Bevin, Rider-Ericsson Engine Company; members of the Executive Committee to serve for four years: F. Ducasse, New York Taxicab Company; G. E. Franquist, Simplex Automobile Company.

Henry C. Hunter, counsel and secretary of the branch, submitted a report reviewing in detail the activities of the organization in the past year, the conditions prevailing in the shops of its members, and treating suggestively the line issues relating to the metal trades. The branch has had a steady increase in membership, and a number of automobile manufacturers have become members in the past year. Ten labor disputes were adjusted, either by conference or by the branch opposing strikes, it being successful in each case. The secretary called attention to the increasing consideration given to the questions of workmen's accident compensation, sick benefits, &c., now being given by employers in all parts of the country and to the official investigations of the subject now under way in several States. The New York and New Jersey Branch has made arrangements with an insurance company for accident indemnity, and further study is being made of the general subject. A matter on which the association had been active in the year was the proposed legislation making accounts for repair work on a vessel a lien upon the vessel property.

Robert Wuest, commissioner of the National Metal Trades Association, addressed the meeting on the labor situation in the metal trades. President Taylor also

spoke, and Vice-President Fogarty referred to labor conditions in New York district boiler shops.

JANUARY IRON AND STEEL EXPORTS AND IMPORTS.

A little smaller movement, both inward and outward, in our foreign trade in iron and steel and manufactures thereof is shown by the January report of the Bureau of Statistics of the Department of Commerce and Labor. The total value of such commodities, not including ore, exported in January was \$14,513,394, against \$15,075,183 in December. The value of similar imports in January was \$3,368,620, against \$3,488,343 in December.

The exports of commodities for which quantities are given aggregated 119,094 gross tons in January, against 137,675 tons in December. The January exports, however, were larger than for any month in 1909 except December. The details of the exports of these commodities for January and for the seven months of the fiscal year ending with January are as follows:

	Exports of Iron and Steel.			
	January		Seven months ending January	
	1910.	1909.	1910.	1909.
Pig iron.....	4,307	3,213	42,379	29,464
Scrap	383	1,312	6,902	11,590
Bar iron	1,308	924	7,834	5,540
Wire rods.....	856	1,076	12,197	4,990
Steel bars.....	7,340	3,558	49,917	24,307
Billets, blooms, &c....	3,080	9,526	47,103	58,018
Hoop, bond, &c.....	406	318	2,692	2,179
Steel rails.....	41,999	13,137	220,945	126,671
Iron sheets and plates	9,118	4,107	50,471	28,813
Steel sheets and plates	12,773	4,424	71,576	37,715
Tin and terne plates.....	851	190	5,844	955
Structural iron and steel	8,319	6,453	53,533	62,490
Barb wire.....	4,365	4,813	42,596	39,530
Wire	8,955	4,310	43,554	34,097
Cut nails.....	472	487	6,045	4,088
Wire nails.....	2,760	2,610	18,313	14,291
All other nails, including tacks.....	613	532	4,480	3,606
Pipe and fittings.....	11,189	9,166	100,857	66,093
Totals	119,094	70,106	787,328	554,427

The imports of commodities for which quantities are given aggregated 58,308 gross tons in January, against 66,054 tons in December. The details of the imports of these commodities for January and for the seven months of the fiscal year ending with January are as follows:

	Imports of Iron and Steel.			
	January		Seven months ending January	
	1910.	1909.	1910.	1909.
Pig iron.....	22,796	11,048	140,337	56,802
Scrap	19,047	169	80,301	3,101
Bar iron	2,178	2,317	14,238	10,041
Rails	927	222	2,089	1,134
Billets, bars and steel in forms, n. e. s.	5,167	1,416	18,082	7,668
Sheets and plates...	609	104	3,690	1,632
Tin and terne plates.....	5,308	3,266	38,091	25,828
Wire rods.....	1,101	1,022	5,958	6,693
Structural iron and steel	1,175	176	4,630	2,960
Totals	58,308	19,740	307,416	115,859

The imports of iron ore in January were 284,823 gross tons, against 222,609 tons in December. Of the January imports, 129,220 tons came from Cuba, 125,090 tons from Europe and 30,513 tons from other countries. British North America appears to have shipped no iron ore to this country in January. The total imports of iron ore for the seven months of the fiscal year ending with January were 1,407,233 gross tons, against 548,333 tons in the corresponding period of the previous fiscal year.

The total value of the exports of iron and steel and manufactures thereof, not including ore, in the seven months of the fiscal year ending with January was \$97,235,095, against \$80,328,052 in the corresponding period of the previous fiscal year. The values of similar imports were, respectively, \$21,245,874 and \$11,601,955.

THE IRON AGE

Established in 1855.

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H. R. COBLEIGH,	-	-	-	-	MECHANICAL EDITOR

Union Labor Running Amuck.

The so-called sympathetic strike is as wrong headed as it is wrong in morals. Not only does it inflict injury upon employers against whom there is no complaint, and upon other members of the community in no wise responsible for the original trouble and powerless to do anything to end it; it also involves the violation of contracts of employment entered into by labor organizations which have no grievance. It is an admission that the original attack has not been effective, and implies a belief on the part of the managers of the strike that injury to innocent persons will accomplish more than injury to those with whom they have a quarrel. It presents the spectacle of organized labor running amuck instead of directing its warfare against those whom it would defeat.

The sympathetic strike as employed by the street car employees' union at Philadelphia indicates that the strike leaders saw their defeat and were covering it up in a general desperate attack upon industry. With the history of such strikes before them, they should have known that there is but one outcome to the sympathetic strike. It turns to hostility the favorable public opinion that is always at the beginning a factor in a strike against a public service corporation, and that later may become a strong weapon of the strikers in compelling some concession from the employing company.

The desperation that prompts the sympathetic strike is shown in its reckless disregard of contract obligations. A union labor leader at Pittsburgh, who urged a State-wide strike of organized labor in support of the Philadelphia street car employees, was reminded that such a move would involve the violation of many existing contracts. The reply was that "in time of war there can be no violation of any kind." It was a familiar statement of the position many officers of labor unions have assumed. Some, notably the leaders of the Brotherhood of Locomotive Engineers, have not yet been known to advocate contract breaking on any such flimsy pretext as that "war is being made on the labor movement," and therefore any agreement made by a union with an employer may be broken. But such a reservation apparently accompanies the signing of a large percentage of contracts made under collective bargaining. The president of the Amalgamated Association of Iron and Steel

Workers announced in the memorable strike of 1901 in the sheet mills of the United States Steel Corporation that the first obligation of every member of that union was to obey the union's orders, and that every contract entered into was with that reservation. It is scarcely necessary to characterize such a standard of contract morals. Fortunately, there are courts and they have never failed to deal appropriately with this species of obliquity when invoked to do so. In business a man who should enter into contracts with such reservations would very quickly find that there was no place for him and his peculiar ideas of honor. Yet some benevolent advocates of collective bargaining are disposed to complain of employers who object to making contracts with unions.

The sympathetic strike, with its attendant use of the boycott, its repudiation of contracts and its indiscriminate infliction of injury upon persons and property, is one of the most malignant features of modern unionism. Any union resorting to it admits and deserves defeat.

The Labor Situation in General.

Curiously enough, the outcome of the exceedingly serious labor struggle in Philadelphia promises to clarify the general labor situation. For some time the apprehension of widespread labor troubles has been steadily increasing. Over and over, the feeling of unrest in labor circles has been commented upon, as likely to prove a disturbance to business this spring which would have to be reckoned with. Of course, much of this apprehension has arisen because of the demands for increased wages by railroad employees. In other directions, however, the rumbling of discontent also seemed portentous.

The Philadelphia car men's strike is the most important which has so far occurred this year. It promised fearsome consequences when the attempt was made last week to call out all classes of labor in the city with the avowed object of paralyzing industry. It was the first time that anything like a general strike had been invoked in this country. We have frequently heard the threat of a general strike and the threat has always carried with it the expectation of direful results. There is something so ominous, so potential, so revolutionary in such a proceeding that business interests have invariably endeavored to ward it off by urging the speedy settlement of the primary issue. In this instance, however, the efforts of outside business interests were unsuccessful and the dreaded event came. The result is most disappointing to those who sought to use this theoretically powerful weapon. There has been no general strike in Philadelphia. Instead of the city's industries being paralyzed, only a limited number of industrial establishments have been closed. We have seen estimates of the number of working people who have obeyed the mandates of the labor leaders, but, as has been well remarked by one of our contemporaries, it is really not necessary to consider numbers in this case. The fact that the working people have not generally obeyed the dictum of the captains of the union labor movement settles the question without regard to the actual numbers involved. It may be said that now that the event has occurred it has been a fortunate occurrence that the general strike has been resorted to, since it is seen how far short of success such a move-

ment has fallen. This threat of labor leaders has probably been deprived of its potency in this country.

The labor troubles of the railroads are in a fair way to adjust themselves without serious consequences. The strike in the machine shops of the Bethlehem Steel Company promises to come to a speedy close without seriously interfering with the operation of the steel works. In various other lines of manufacturing activity, employers are disposed to be conciliatory and are granting advances in wages which seem to have been compelled by the higher cost of living. Taking the situation as a whole, it would appear that labor conditions are not likely to prove nearly so disturbing to business this spring as had been feared.

A Scientific Testing Station for Machinery.

Builders of machine tools, no matter how well they may strive to acquire perfection of equipment and personnel, discover at more or less frequent intervals that they have sent out machines in which weaknesses have developed, requiring the services of experts to make them what they were designed to be. Personal error will sometimes creep into a product, no matter what precautions may be taken to prevent it. The weaknesses of imperfect materials sometimes are hidden. All high class machinery is tested by its manufacturers, but in only a few cases is the effort made to secure exact records of a machine by the use of engineering instruments, while it is still on the floor of the home shop, and, by severe duty, to develop all structural weaknesses.

A system intended to accomplish these purposes is in operation in the shops of the Bullard Machine Tool Company, Bridgeport, Conn. Each machine is set up at a testing station, where a dynamometer and watt meter, in combination with a series of thermometers, tell a graphic story of the construction. The boring mill or vertical lathe has previously been given the usual running test. At the testing stand it is run without a load for an hour, the power consumed at the various speeds being recorded on a chart. In each important bearing a thermometer is inserted to ascertain if any undue degree of heat is generated, and such data are carefully kept. For the second hour the dynamometer applies a load which is twice that which the machine is designed to endure in its life as a manufacturing instrument. During the third hour it is run without load again, in order that any results of the severe strain may be brought out, in comparison with the record of the first hour. The various feeds are tested out. The records of every machine are preserved. When it leaves the shop its builders feel an assurance that any possible trouble that may develop will probably be the fault of the buyer.

The argument may be made that a thoroughly built machine tool, with each part within predetermined limits of accuracy, should have the required perfection; that a complete system of inspection should find all imperfections of parts, and that the usual running test should bring out all faults of assembling. Nevertheless, machines of the highest reputation sometimes give trouble, making necessary changes and corrections, which cost time and money and a certain sacrifice of prestige, and which entail for customers the loss of the use of a tool upon which they had depended. The engineering test is not a costly undertaking. If the exact

facts could be obtained it would probably be found that the cost is no greater than that of perfecting machinery which has been delivered untested. Very likely an actual economy could be figured out.

In the same shops a department for the testing for hardness of all hardened steel parts has done an excellent work by determining the limits within which the best results are obtained under the individual conditions to which each part is subjected. By repeated test and experiment a well defined practice has been established, and, as every piece of every lot is tested, improved construction has followed. The influence on the forge shop is evident. The degree of hardness best suited to a tool head bolt would not do for a pin which must resist constant wear. In the former, frequent breakage would follow a brittle hardness. In the latter the medium degree would mean quick wear. And so the variation runs through the list of hardened parts which enter into a machine.

The machine tool industry has advanced with wonderful speed in the refinements of manufacturing. What is common practice to-day may have been considered wholly unnecessary and even extravagant a generation ago. The industry has been quick to follow along those lines which enterprising members have demonstrated to possess value. In a few years more the engineering test should be common enough, and even more highly developed in its thoroughness. At present the subject is being given more and more serious attention.

Large Buying for the Equipment of Lake Iron Mines.

The iron trade has been so long used to the prodigious figures representing Lake Superior ore shipments that the significance of the mining and moving of more than 40,000,000 tons of iron ore from that region in a year is little appreciated. Gathering and maintaining labor organizations and providing in season the equipment requisite not only for getting out the quota of ore for a particular year, but for the development of mining properties—all the dead work that must be carried on apart from meeting immediate demands upon the mines—constitute a problem of the first class. The railroad and dock operations at the head of the lakes are another problem; the bulk freighters of the lakes another, and the great docks at lower lake ports with their high capacity unloading equipment another; while the facilities of transportation between the docks and the blast furnaces complete the vast mechanism. The movement of nearly 42,600,000 tons of ore last year was a monumental performance; yet the programme for 1910 calls for the bringing down of several millions of tons more. This means important additions to the equipment of Lake Superior mining companies, and as indicated in correspondence from Milwaukee appearing elsewhere in this issue large contracts for such equipment have been placed with the builders of such machinery. It is noteworthy that important iron mining companies are now contracting or planning for their wants in the immediate future on a larger scale than at any time in their history. The stimulus given by such years as 1909 and 1910 to the business of Michigan and Minnesota mining communities, through new construction to meet the influx of new population, is a marked feature of this expansion.

CORRESPONDENCE.

The American Exposition in Berlin.

To the Editor: As pioneers in the export of American industrial products, we have naturally followed developments in regard to the American exposition proposed in Berlin with considerable interest and cannot very well accept the idea that the Germans, with their usual keen and fundamental study of conditions, should have looked upon this enterprise with jealousy for fear they might be the losers. We think the contrary is the case, and we believe that the lack of interest on the part of American manufacturers is more the cause of the failure than the indifference of the Germans, and this is quite natural. Developments and progress in industries are so great among the Germans that they have gained considerably in the race for supremacy and leadership, and we are convinced that the advantage of an American exposition in Berlin would be so strongly in favor of the Germans that we can fully understand the indifference of the manufacturers of this country to go there and show their own progress.

Being so deeply interested in export matters, we have instituted an extensive correspondence with American manufacturers in reference to this exposition, and have met in every case with antipathy and indifference toward such an undertaking, for the simple reason that we would go there, show them our latest inventions, improvements and methods, with no other prospects than to do the missionary work, introduce our lines and have them copied in German workshops, which experience has taught us is being done freely and successfully, owing to the advantages of a lower level of wages and reasonable protective duties. As we understand, several important industrial firms, such as Ludwig Löwe of Berlin, have been the strongest advocates of an American exposition in Berlin. That particular firm has copied American inventions to an enormous degree and a perusal of its illustrated catalogue will demonstrate this fact; so why should manufacturers of this type be afraid of our going to Germany to show them what we can make? The Germans have every interest in promoting an American exposition, and it is for the Americans to consider whether it is wise to do so.

It goes without saying that, exposition or no exposition, the Germans will have an opportunity to see any way what our inventive genius in this country produces, but, if so, we do not see the need of American manufacturers, at great expense to themselves, hastening to educate their competitors. The decision to postpone this exposition for another year, we believe, under the circumstances, has been the wisest thing to do.

MARKT & HAMMACHER COMPANY.

NEW YORK, March 2, 1910.

Westinghouse Leblanc Pumps.—The Leblanc steam condensers and air pumps, which are manufactured in this country by the Westinghouse Machine Company, East Pittsburgh, Pa., appear to be in great favor with the French Government, as will be seen by the following letter from the manager of the French Westinghouse Company in his report to Mr. Robert Mather, chairman of the board of directors of the Westinghouse Electric & Mfg. Company: "The results obtained by the French navy with the Leblanc air pump supplied last year to the torpedo boat destroyer *Voltigeur* have brought us orders from the French navy for the equipment of three destroyers and also an order for the four destroyers now building in France for the Argentine Republic. Another trial of interest to us has been made by the navy, which has resulted in the decision by the authorities to withdraw and abandon

the Weir wet pumps on three dreadnaughts already built and to substitute Westinghouse Leblanc pumps. We are also practically assured of the condensation plant for the fast mail steamer *La France*. Our air pumps have now become practically the only type considered in the present naval programme in France."

The Bethlehem Steel Company Strike.

President Charles M. Schwab of the Bethlehem Steel Company, in the following letter, given to the press March 6, indicated the attitude of his company toward the unions whose demands have recently been presented:

I am in receipt of a communication which I desire to make public and state our position in reference thereto. We infer that the communication bearing the signature "Executive Committee" originated either with representatives of organized labor or men who have left our employ during the past month. We desire to notify the men who have left our employ, as well as the general public, that we can give no consideration to the communication, since it does not emanate from men working in our plant. It must be understood that under no circumstances will we deal with men on strike or a body of men representing organized labor.

Having thus defined our position, we shall refrain from further statements or acknowledgments of any communications or solicitations from any source whatever.

It is stated in press dispatches that the communication of the executive committee of the strikers sent to Mr. Schwab covers the demands of cranemen, machinists, forgemen, open hearth men, Grey mill men, iron and steel foundrymen, blacksmiths, crucible workers, carpenters, cold saw men, steam engineers, boilermakers, patternmakers, laborers, molders and apprentices. All the men ask for time and half time for overtime work, but the open hearth, carpenters, blacksmiths, patternmakers, machinists and crucible workers want double time for work on all legal holidays. The working day asked for runs from 10 to 12 hours. A meeting of the strikers was held on Monday, March 7, to discuss Mr. Schwab's letter and to make reply to it.

Lake Superior Iron Ore Shipments in 1909.

The statistics of Lake Superior iron ore shipments in 1909 as compiled by *The Iron Trade Review* show that the estimate of 42,500,000 gross tons heretofore made, in the absence of the complete figures for all-rail shipments, was exceeded by nearly 87,000 tons, the total being 42,586,869 tons. This includes the shipments from two detached Wisconsin mines—15,955 tons from the Iron Ridge mine of the Illinois Steel Company and 66,804 tons from the Mayville mine of the Northwestern Iron Company. The Illinois mine of the Wisconsin Steel Company (International Harvester Company), on the Baraboo range, Wisconsin, did not ship ore in 1909. It produced 51,108 tons in 1908, and its total shipments, beginning with 1904, have been 309,741 tons. The shipments by ranges in the past four years are given below in gross tons:

	1909.	1908.	1907.	1906.
Marquette range...	4,256,172	2,414,632	4,388,073	4,057,187
Menominee range...	4,875,385	2,679,156	4,964,728	5,109,088
Gogebic range.....	4,088,057	2,699,856	3,637,102	3,643,514
Vermilion range....	1,108,215	841,544	1,685,267	1,792,355
Mesaba range.....	28,176,281	17,257,350	27,495,708	23,819,029
Miscellaneous	82,759	122,449	95,790	144,589
Totals.....	42,586,869	26,014,987	42,266,668	38,565,762

The lake shipments in 1909 as already given in these columns were 41,683,599 tons, and the all-rail shipments 903,270 tons. The shipments from the Helen mine of the Lake Superior Corporation, on the Michipicoten range in Ontario, which were 170,065 tons last year, are not included in the above table.

OBITUARY.

CHARLES F. AARON.

Charles F. Aaron, ex-president of the American Supply & Machinery Manufacturers' Association, died at his home in Plainfield, N. J., March 4, aged 43 years. In January Mr. Aaron underwent an operation and apparently recovered, but in his still weakened condition his heart failed and the end came suddenly and unexpectedly. At the time of his death he was general sales manager of the New York Leather Belting Company and his removal will be a distinct loss to the leather industry, in which he took a very prominent part.

Mr. Aaron was born in New York in 1866. Starting at the bottom of the ladder in the leather business, he devoted a number of years to studying and mastering the tanning and manufacturing branches,



CHARLES F. AARON.

during which time he served a regular apprenticeship in the factory. At the completion of his term he became a salesman and shortly afterward was promoted to take charge of the Chicago territory. After several years in this field he was promoted to the position which he held at the time of his death. He put into operation a new system of distributing the company's products and one which is followed by few houses in the same line in this country, namely, that of distributing their products exclusively through dealers.

For several years prior to the organization of the American Supply & Machinery Manufacturers' Association Mr. Aaron had been prominently identified with the Southern Supply & Machinery Dealers' Association. When the American Association was formed, nearly five years ago, Mr. Aaron was elected second vice-president and ex-officio member of its executive committee. The following year he was re-elected and in 1907 was made chairman of the committee. At the convention held in Richmond in 1908 he was elected president. It was largely the interest and knowledge of Mr. Aaron which led the executive committee of his organization in February, 1909, to adopt its "Declaration of Principles." He was a strong advocate of fair play both on the part of dealers and manufacturers in all lines, and stood as a staunch and ardent advo-

cate of the policy of selling to dealers exclusively. His personal influence went far in the counsels of the executive committee of the association, and it was he that initiated the movement for specified standards to safeguard the dealer in mill supplies. An extensive account of these matters appeared in *The Iron Age* June 3, 1909. He leaves a widow and three daughters.

RICHARD C. OLIPHANT.

Richard Coulter Oliphant, president of the Trenton Malleable Iron Company, Trenton, N. J., and long prominent in the foundry trade of the country, died March 4, aged 57 years. He was born September 6, 1852, in Uniontown, Pa., and was one of 10 sons of General Samuel D. Oliphant. His ancestors were engaged in iron manufacture at Uniontown and for nearly a century a blast furnace was operated there by some member of the family. After his public school course and a partial course at Princeton University Mr. Oliphant engaged in the insurance business at Chicago. Later he returned to Uniontown and was connected with his father and brother, Hughes, in the operation of a blast furnace. The furnace at Uniontown has been one of the first in the United States to make pig iron using coke as a fuel.

In 1881 Mr. Oliphant engaged in pottery manufacture at Trenton, N. J., being associated for a time with his father in the Enterprise Pottery Company, and later becoming manager of the Delaware Pottery. On the absorption of the latter in the Trenton Potteries Company, he became connected with the Trenton Malleable Iron Company and was its president and general manager until his death. Mr. Oliphant was married in 1883 and his wife and two sons, Ross Gould and Donald Creigh, survive him, Ross Oliphant being connected with the J. L. Mott Iron Company. Two of Mr. Oliphant's brothers were associated with him in business, Samuel D. Oliphant, Jr., being vice-president and James V. Oliphant secretary and treasurer of the Trenton Malleable Iron Company. Active in politics for a number of years, Mr. Oliphant served in the City Council at Trenton. He was one of the organizers and for two years president of the Manufacturers and Employers' Association of that city and was active in the organization of the Chamber of Commerce. For a number of years he was prominent in the National Founders' Association, being a member of the administrative council in 1905 and 1906.

SAMUEL M. BRONSON, treasurer and general manager of the National Machine Company, Hartford, Conn., died March 1, aged 78 years.

EDWARD PRIDMORE, Batavia, N. Y., for practically all of his working life identified with the Johnston Harvester Company of that city, died March 4, at an advanced age. He was the father of the late Henry E. Pridmore of Chicago, manufacturer of molding machines, and also of John Pridmore, head of the experimental department of the International Harvester Company. In the development of the harvesting machine to its present state of efficiency members of the Pridmore family have held a very high position as inventors, designers and mechanical experts. The senior Pridmore was one of the first men in the harvesting machine industry to combine the genius of the inventor with the practical ability of the master mechanic.

The American Belting Company, Youngstown, Ohio, in addition to its Western office at 161 Lake street, Chicago, Ill., now has its own Eastern office at 100-102 Reade street, New York City. Daniel Ar-buckle, formerly with the Gandy Belting Company, Baltimore, Md., is now sales manager of the American Belting Company, with headquarters at Youngstown, succeeding S. W. Luce.

PERSONAL.

John D. Rockefeller, Jr., a director of the United States Steel Corporation since its organization, has resigned, and has been succeeded by Henry Walters, chairman of the Atlantic Coast Line. It is stated that Mr. Rockefeller will devote all his time to the management of his private business and to philanthropy, represented by the General Education Board, Chicago University, and, above all, the Foundation which bears his and his father's name and is intended to be the family monument.

Wm. B. Stoop, formerly of Youngstown, Ohio, has become connected with the Portsmouth Steel Company and is superintending the construction of the new blooming mill and other additions to the company's plant at Portsmouth, Ohio.

R. S. Shoemaker, for some time connected with the Pittsburgh Steel Company at Monessen, Pa., as electrical engineer, has become assistant consulting engineer of the Algoma Steel Company, Ltd., Sault Ste. Marie, Ont.

F. E. McKee, who until February 1 was electrical engineer for the Pressed Steel Car Company, Pittsburgh, Pa., has accepted a position as assistant manager of the Shaw Electric Crane Company, Muskegon, Mich.

H. A. Steen, for seven years designing engineer of industrial controlling devices with the Westinghouse Electric & Mfg. Company, has accepted a similar position with the Allis-Chalmers Company, Milwaukee, Wis.

Dr. Richard Moldenke has just returned from a professional trip to Europe. At Berlin he attended a meeting of foundrymen, engineers and foundry foremen of northern Germany and made an address on American foundry practice.

F. Von A. Cabeen, Jr., for a number of years connected with Rogers, Brown & Co., Philadelphia, has joined the sales forces of the Longstreth Motor Car Company, in that city, representing the Pullman and Alco automobiles.

Michael Blake of John Leonard & Co., 149 Broadway, New York, has been elected a trustee of the Emigrant Industrial Savings Bank, which is one of the largest institutions of its kind in the country, and also a director of the Fourteenth Street Bank.

In addition to his duties as industrial agent of the Lake Shore Railroad Company and other lines of the New York Central system, E. J. Dowie has been appointed industrial agent of the Cleveland Short Line Railway Company, which is building a belt line around Cleveland, Ohio. The western portion of this line has been completed, making considerable new property available for manufacturing sites.

George U. Poole, manager of the Boston branch of the Dodge Mfg. Company, Mishawaka, Ind., lectured before the Mechanical and Electrical Society of the University of Maine, February 26, on the manufacture of pulleys and castings and on methods of transmitting power by means of both belt and rope drives.

W. B. Trainer, assistant superintendent of rolling mills at the Duquesne Works of the Carnegie Steel Company, Duquesne, Pa., has been made superintendent to succeed Carl F. Maeder, who recently resigned to become general manager of the Western Steel Corporation, Irondale, Wash. The position left vacant by Mr. Trainer's promotion will not be filled at once, and may be discontinued.

Wilson A. Luce has been appointed assistant general manager of the Ellsworth Collieries Company, at Ellsworth, Pa., effective March 1. The Ellsworth Collieries Company is a subsidiary of the Lackawanna Steel Company.

Germany's Tariff Agreement with Canada.

TORONTO, February 28, 1910.—The tariff war in which Canada and Germany have been involved since 1903 comes to an end at the close of the present month. Canada's surtax, which was forged, so to speak, as a weapon of this war, will cease to be used against Germany, and Germany's conventional tariff, whose privileges were closed to Canada, is now to be applied to the main staples imported from Canada.

On Germany's side the tariff hostility dates back to 1897. In that year Canada granted its tariff preference to Britain. Germany insisted on equally favorable treatment by Canada. It held that its commercial treaty with Britain, to which treaty Canada was a party, secured it most-favored-nation rights in this country. The British Government recognized the force of this contention. Canada then gave notice that, as it desired to restrict the preference to Britain, it must ask to be released from the treaty. But Canada could not be released unless Britain withdrew from the treaty. Accordingly, the British Government denounced the treaty, which duly came to an end. Thus liberated, Canada was in a position to make the preference exclusive and exclusive it has since been.

Great Britain and Germany afterward entered into negotiations for a new commercial treaty, but Germany would not consent to Canada's inclusion. The German Government imposed its maximum duties on imports from Canada, and after submitting to this for some years Canada retaliated with its surtax, which added to the duties on imports from Germany one-third more than those of the general tariff. Trade between the two countries shrank in consequence of these less friendly commercial relations.

Canadian manufacturers generally are not pleased with the settlement. The surtax induced domestic enterprise to take up the manufacture of several lines which had previously come from Germany. According to dispatches of the Canadian Associated Press, many British manufacturers are not more pleased. The arrangement is expected to have the effect of largely neutralizing the benefit of Canada's preference to Britain. The head of one of the principal steel firms at Sheffield is quoted as saying that Germany's competition in Canada would be much increased. Some of the cutlery firms in that city venture the opinion that they will be met by low-priced German goods in Canada.

C. A. C. J.

The Robins Conveying Belt Company announces that arrangements have been made for the removal of its executive offices and sales, engineering and purchasing departments to the twenty-sixth and twenty-seventh floors and both towers of the Park Row Building, 13 Park Row, New York. Its occupancy of the new quarters will be completed by Saturday, March 12. This suite is the one occupied by the company up to two years ago, when its general offices were removed to the works at Passaic, N. J.; and a branch office was opened in the Terminal Building, at 30 Church street, New York. The office at the Church street address will now be discontinued, being combined with the other offices in the Park Row Building.

The Drop Forging Company of New York, with factory and office at West Side avenue and Fisk street, Jersey City, N. J., is manufacturing a general line of drop forgings and also a specialty known as the Spartan chain pipe wrench. The officers of this company—A. M. Tilton, president; G. H. Butler, treasurer, and John Lee, secretary—were formerly associated for a number of years with J. H. Williams & Co., Brooklyn, N. Y. Their wide experience in the manufacture of drop forgings and chain pipe wrenches should enable them to guarantee a first class product and handle intelligently intricate forgings of any special material.

The American Radiator Company.

The eleventh annual report of the American Radiator Company, covering the fiscal year ending January 31, 1910, shows the largest net profits in its history. The income account compares with the previous year as follows:

	1910.	1909.
Net profits.....	\$971,600	\$901,254
Preferred dividends.....	210,000	210,000
Balance.....	\$761,600	\$691,254
Common dividends.....	400,000	300,000
Surplus.....	\$361,600	\$391,254
Previous surplus.....	4,165,050	3,773,798
Total surplus.....	\$4,526,650	\$4,165,050

The balance sheet as of February 1 presents the following comparison:

	Assets.	1910.	1909.
Real estate, plants, machinery, patents, &c.....	\$8,611,259.14	\$8,531,284.63	
Additions during year.....	281,920.80	179,974.51	
Totals.....	<u>\$8,893,179.94</u>	<u>\$8,711,259.94</u>	
Less depreciation.....	200,000.00	100,000.00	
Net.....	<u>\$8,693,179.94</u>	<u>\$8,611,259.94</u>	
Cash	\$774,408.30	\$747,613.44	
Notes receivable.....	10,834.03	17,247.25	
Accounts receivable.....	1,167,051.21	1,241,480.34	
Raw material, supplies and finished products	2,192,556.46	1,769,147.30	
Total quick assets.....	<u>\$4,144,850.00</u>	<u>\$3,775,488.33</u>	
Totals.....	<u>\$12,838,029.94</u>	<u>\$12,386,747.47</u>	
	Liabilities.		
Preferred stock.....	\$3,000,000.00	\$3,000,000.00	
Common stock.....	5,000,000.00	5,000,000.00	
Accounts and bills payable.....	\$8,000,000.00	\$8,000,000.00	
Total liabilities.....	\$8,311,379.98	\$8,221,697.03	
Surplus	4,526,649.96	4,165,050.44	
Totals.....	<u>\$12,838,029.94</u>	<u>\$12,386,747.47</u>	

From the accompanying remarks to the stockholders by President Clarence M. Woolley, the following extracts are taken:

During the past year a plant was put in operation at Birmingham, Ala., thus making it possible more advantageously to serve our customers in the Southern States. The producing capacity of all our plants was increased during the year by extensions to buildings and by the introduction of additional equipment. These factories produced an abundance of supply, and the 25 warehouses located in all of the important trade centers of the country were constantly furnished with adequate stocks, enabling the company to render prompt and satisfactory service to its customers in all sections.

The sales in the Western States, until recently, have not been large enough to justify the construction of factories west of the Mississippi River. The development of the industry now warrants the further extension of the company's producing district, extending it in a westerly direction to include the Missouri River section, and a new plant is in process of construction at Kansas City, which will be ready to operate on or about October 1, 1910.

The German company has enjoyed a prosperous year, and the new plant which it is building at Neuss on the Rhine will be ready for operation on or about August 1. The first plant established by this company is located at Schoenebeck, a suburb of Magdeburg, on the Elbe. The French company has also increased its business and profits and is enlarging its plant at Dole, to meet the steadily growing demand. The English company has likewise enjoyed a prosperous year, increasing its business and profits. It is extending its plant at Hull to provide an adequate supply for the larger demand in the territory it serves. An Italian company has been organized, and land purchased at Brescia, 30 miles east of Milan, upon which a plant will be constructed this year. The demand which already

exists in Italy is sufficiently large to warrant this enterprise. Heretofore this territory has been supplied by the other European factories. A large saving in the cost of transportation and in customs duties can be made when this project is consummated. The profits realized by the European companies continue to be employed in extending the business abroad and no dividends have as yet been declared by them.

The Dayton Supply Company Separates Manufacturing From Supply Interests.

The Dayton Supply Company, located at Dayton, Ohio, and which heretofore has done business as a jobber in plumbers' and gas and steam fitters' supplies, as well as a manufacturing business, will hereafter separate these two lines. F. J. McCormick will retain the manufacturing end of the business under another name, and James W. Downer, for some years with the National Tube Company at Pittsburgh, has organized a company, with \$150,000 capital, to take over the jobbing end, consisting of the plumbers' and gas and steam fitters' supply business, which will be operated by a corporation known as the Dayton Supply Company. Mr. Downer will be president of the new interest, which took possession of the business February 7. He was with the National Tube Company for 25 years. He started in at McKeesport and in 1888 went to the New York offices. In 1895 he organized the export department and represented the National Tube Company, with offices in London, England, from 1897 to 1904. When this export business of the National Tube Company was turned over to the United States Steel Products Export Company in 1904 Mr. Downer returned to Pittsburgh and was made general manager of sales of the National Tube Company, from which concern he severed his connection some time ago.

The Safety of Workmen.—The February *Safety*, the official bulletin of the American Museum of Safety and Sanitation, Engineering Building, 29 West Thirty-ninth street, New York, is an illustrated number, and begins the policy of the museum to describe by means of illustrations the more important safety devices that have been accepted by the Executive Committee. The feature article is devoted to the lineman's protective shield, a sort of trough made of rubber, which affords perfect insulation for the linemen or other workmen in connection with the live part of the circuit. This device not only affords safety to the men but enables them to perform their work better and faster, and also effects economy in time and money for the company. The March *Safety* describes devices for the use of window cleaners employed on tall buildings. The museum invites information regarding all safety devices, so that it may have this material for its own use and for the service of others.

The Colburn Machine Tool Company's New Plant.—The Colburn Machine Tool Company, Franklin, Pa., builder of vertical boring and turning mills, recently purchased the large factory building adjacent to its works. This building is 65 x 215 ft., two stories, with an ell 30 x 168 ft. along the railroad, affording excellent shipping facilities. An industrial railroad system will connect the present shop with the new addition. The work of remodeling the interior to accommodate the needs of the new owner will be started at once. A large section will be devoted to storage purposes, which will greatly relieve the congested condition of the present shop. The pattern department will also be moved into this new building and several thousand additional feet of floor space will be available for manufacturing purposes. The rapidly increasing business of the company has made the acquisition of more room imperative.

Southern Iron & Steel Company Progress.

From the report of President W. H. Hassinger presented at the annual meeting of the Southern Iron & Steel Company, February 17, 1910, the following is taken:

The Southern Iron & Steel Company was incorporated on March 15, 1909, and on or about April 12, 1909, acquired the properties formerly owned by the Southern Steel Company, the Chattanooga Iron & Coal Company and the Lacey-Buek Iron Company, as well as the entire capital stock of the Georgia Steel Company. Briefly, the properties of the company and of its subsidiary company, the Georgia Steel Company, are as follows: Coal lands and rights, 43,613 acres; red ore lands and rights, 21,142 acres; brown ore lands and rights, 20,580 acres; 4 blast furnaces, 6 open hearth steel furnaces, 918 coke ovens, 6 coal mines, 3 brown ore mines, 5 red ore mines, 3 limestone quarries, new wire, rod and fence mill (now nearing completion).

Upon the completion of the organization and after careful examination and inspection, the contemplated repairs, betterments and improvements were agreed upon, and the work of rehabilitation entered upon with all possible expedition, with a view, nevertheless, to economy and thoroughness of work. The work of rehabilitation was commenced on or about September 1 last, and involved an overhauling and general repair of the blast furnaces at Chattanooga, Trussville and Alabama City, the steel plant at Alabama City and the coke ovens, also the overhauling, unwatering, cleaning up and retimbering of the coal and ore mines and the equipment incident thereto, as well as the development of additional territory, materially increasing the output of the company's mines.

On October 8, 1909, the blast furnace at Trussville was started, and on October 25, 1909, the blast furnace at Chattanooga, and on February 8, 1910, the blast furnace at Alabama City. The operations of these three furnaces have been entirely satisfactory, and their present output at the rate of approximately 20,000 tons per month considerably exceeds their previously estimated tonnage; in addition to this, by reason of economies effected in the mining of the ores and coal, the making of coke and the operation of the furnaces themselves, the cost of pig iron has been materially reduced and is already considerably below the previously estimated cost.

The mills for the manufacture of wire, rods, fencing, nails and other steel products were located at Ensley, a distance of 60 miles from the steel plant at Alabama City. The Board of Directors determined that instead of spending a large amount of money on the repair and improvement of the old mills at Ensley, economy and effectiveness of operation required that a new modern mill be built at Alabama City, so as to concentrate the iron, steel and finishing product plants at that point, thus effecting the economies resulting from such concentration, including freights, overhead charges, insurance, water rents, &c.

The mill now being constructed at Alabama City and which should be completed by April 1, 1910, is practically a new mill and second to none in the United States, having a capacity of 350 tons of wire products and 100 tons of other miscellaneous finished products per day, being double the capacity of the old mill.

While the market for pig iron since the commencement of the operations of the furnaces has not been all that might be desired, the company has been able to dispose of the greater part of its output at profitable prices.

Owing to the short time which has elapsed since the company took possession of the properties, and the great amount of work which has been done, and is being done, in the rehabilitation, improvement and exten-

sion of the plants, I have determined to defer presenting a profit and loss account and a balance sheet until the new construction is finished and all the plants are in operation. I am pleased to say, however, that, based on the present prices of pig iron, our production of pig iron alone indicates earnings considerably in excess of our fixed charges, and I am confident that, upon the completion and operation of the steel plant and the rod and wire mills, the average annual net earnings of the company will be considerably in excess of my previous estimate of \$1,200,000.

The Detroit Stove Trade.*

BY GEORGE H. BARBOUR.

Prior to the year 1858 Albany and Troy, N. Y., were considered the great center of the stove manufacturing business. Buffalo, N. Y., was another point where many stoves were produced 40 or 50 years ago, but today a great change exists and but few stoves are made in the localities mentioned above. The reason for this is that the stove concerns of Detroit have taken their place, and Detroit is now the center of stove manufacture.

Jeremiah Dwyer, the pioneer stove manufacturer of Detroit (to whom you cannot give too much credit, as he is deserving of it), established the stove industry of Detroit back in the year 1861, starting in a very small way. As he had the concerns in the East to compete with he found it uphill work and was somewhat discouraged. He finally interested W. H. Tefft and M. I. Mills in the subject and together they formed the Detroit Stove Works in 1864. One of the strong arguments presented by the Detroit Stove Works officials in favor of manufacturing stoves here was that in our own State, in the Lake Superior District, we had the best ores for making iron to produce stoves.

In 1871 Mr. Dwyer organized the Michigan Stove Company, with Charles A. Du Charme, myself and others. In 1881 the Peninsular Stove Company was organized by James Dwyer. Since then the Art Stove Company has been organized and other smaller stove concerns here, all of which have been very successful.

Stoves Well Finished.

One thing that made Detroit stoves become popular was the grade of the stoves produced, and especially the embellishment in the way of nickel, and they gained a reputation which enabled the manufacturers to conclude there was room for more first-class stoves of a higher grade than had been previously made to any great extent. The Detroit stove manufacturers also became popular through the line of patterns known as the baseburner type. Detroit can boast of having the largest baseburner business of any place in this country.

The four leading stove concerns here employ in the aggregate 3500 to 4000 men, with an annual payroll of \$3,000,000; the payrolls are every two weeks, so that the employees do not have to wait a long time for their money. Consider what this means; men, estimating, as is safe, an average family of four people for each married man, this means caring for 16,000 people, quite a little settlement in itself. When you further consider that the amount of money used for these people is distributed among the merchants of our city, it has added greatly in the building up of the interests of Detroit.

The product of the four stove companies approximately is figured at over 350,000 finished stoves yearly, representing a value of between \$6,000,000 and \$7,000,000.

It may be said, and truthfully, that producing as the Detroit manufacturers do, a high grade of stoves and

* Address before the Wholesalers' and Manufacturers' Association of Detroit, Mich., March 2.

ranges, we have called together a higher class of mechanics than is employed in the general stove institutions outside. In addition, the high character of goods produced and employing this high class of mechanics results in our men being more steadily employed and the work less interrupted than elsewhere.

Twenty-five Trades Given Work.

To give you a slight idea of the different departments of the stove manufacturing business, let me say there are employed in our institution not less than 25 different trades, as it requires that number to produce a finished stove or range.

There is no country that is as well equipped and able to produce as modern and improved stoves as are made in the United States. I have often been asked if we did much foreign business and my response was: We have never sought much foreign business for several reasons. Goods shipped to foreign countries take an extra charge for crating and packing; there is freight allowance, and when all this is taken into consideration, and selling at the same prices at which we sell to American trade universally, the profits do not show sufficient margin to make the business very attractive in foreign countries. Arguments have been presented that the American manufacturers (I do not refer directly to the stove business but to general manufacturers) were selling their manufactured product abroad for less than it is sold to the American dealer. So far as the stove business is concerned, I assure you this is not true, and I do not think the practice prevails to any extent in this country.

The evolution of stove building has been phenomenal. At first the patterns were crude, the castings heavy and rough; no ornamentation; while to-day we have finished construction for all kinds of fuel, made from the very best materials to be found, by skilled workmen, and some of these finished goods are works of art. The stove industry of Detroit, I believe, can well be considered one of the most sterling and substantial in our city, and is a great credit to Detroit and its citizens.

The State of Texas and Its Blast Furnace.

AUSTIN, TEXAS, February 25, 1910.—The State still has its iron industry on its hands. It was recently announced that all preliminary arrangements had been made by the Board of State Penitentiary Commissioners and Governor Campbell for the lease of the iron furnace and pipe manufactory at Rusk to John L. Wortham of Dallas and associates. The terms of the proposed lease had been agreed upon, and the price of 90 cents per ton that the prospective lessees were to pay the State for iron ore was said to be satisfactory to all the parties concerned. All that remained was the signing of the lease to make the contract binding. Mr. Wortham came here for that purpose, but informed the representatives of the State that instead of having the lease made to himself individually he desired that it be in the name of the John L. Wortham Iron Company, composed of John L. Wortham, J. T. Jones and Reagan Wofford of Dallas and Sheb Williams and Walter P. Wortham of Paris, Texas. It was then that the hitch occurred that caused the whole transaction to fall through.

Governor Campbell had the Attorney-General prepare an antitrust affidavit and informed Mr. Wortham that he and his associates would have to sign it before the transfer would be made. The affidavit feature was a surprise to Mr. Wortham, and he declined to sign it. The negotiations ended there and then. The proposed affidavit was as follows:

That the stockholders in the John L. Wortham Iron Company, nor either of them, hold or own any stock or interest in any iron and steel manufacturing concern; that the said company was not and will not be affiliated with or

connected directly or indirectly with any steel or iron concern in the United States or elsewhere; that the State iron plant proposed to be leased will be operated and its business conducted as an independent concern and in all things according to the laws of the State of Texas.

Mr. Wortham was told that if he desired to take over the industry individually he need not sign the proposed affidavit. He also declined this proposition. It is announced by Governor Campbell that the State will keep the plant closed down until it is sold or leased.

The Railway Steel Spring Company.

The annual statement of the Railway Steel Spring Company, giving the results of the company's business for the year ending December 31, 1909, shows a much more satisfactory condition than that experienced in the previous year. In 1908 a deficit of \$179,059 was shown after the payment of \$944,986 in dividends on the preferred stock, while in 1909 a surplus of \$718,759 remained. The income account for 1909 is as follows:

Gross earnings.....	\$7,843,292.85
Less manufacturing, operating and administrative expenses, &c.....	5,782,754.33
Balance	\$2,060,538.52
Less maintenance and depreciation charges.....	194,077.72
Net earnings.....	\$1,866,460.80

Deduct:	
Interest on Latrobe plant 5% bonds, due July 1, 1909, and January 1, 1910	\$202,701.67
Dividends on preferred stock.....	945,000.00
Total	1,147,701.67
Surplus for the year 1909.....	718,759.13
Surplus, December 31, 1908.....	2,270,942.04

Total surplus, December 31, 1909..... \$2,989,701.17

Following is a statement of assets and liabilities at the close of business December 31, 1909:

Assets.	
Plants, properties, &c.....	\$30,568,226.70
Inventories; materials, supplies and products, finished and in process	1,927,367.09
Stock, bonds and investments.....	221,492.11
Accounts receivable.....	1,667,020.60
Other items.....	37,709.47
Cash	382,189.96
Total	\$34,804,005.93

Liabilities.	
Preferred stock.....	\$13,500,000.00
Common stock.....	13,500,000.00
Latrobe plant 5% bonds.....	3,945,000.00
Accounts payable.....	672,304.46
Reserved for preferred stock dividend, taxes, &c.....	197,000.30
Surplus	2,989,701.17
Total	\$34,804,005.93

William H. Silverthorn, president, in his accompanying remarks to the stockholders, says: "During the year an increased demand for the company's products has developed. The plants and organization of the company have been in first-class condition to respond to this demand, and the gross and net earnings of the company have consequently shown a marked increase. The increased earnings of the railroads of the country, with the consequent resumption by them of improvements and extensions, make the outlook favorable. The year closed with orders on the company's books considerably in excess of the orders at the end of the preceding year. The provisions in regard to sinking fund payments provided for in the mortgage given to secure the Latrobe plant 5 per cent. gold bonds were complied with, and the trustees of the sinking fund redeemed and cancelled bonds to the extent of \$138,000 in principal amount, leaving \$3,945,000 outstanding."

N. W. Ayer & Son, advertising, have removed their New York offices to the Fifth Avenue Building, Fifth avenue and Twenty-third street, where they have secured increased facilities for the transaction of their business.

S. FISCHER & SONS,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

NEWS OF THE WORKS.

IRON AND STEEL.

The Garrett-Cromwell Engineering Company, Cleveland, Ohio, will soon take bids for construction of the 65-ton open hearth furnace which the New York State Steel Company is to add to its plant at Buffalo.

The furnace of the Standard Iron Company at Goodrich, Tenn., made 1834 tons of foundry iron in February, the iron grading No. 2 or higher. This is 65½ tons a day, the best daily average ever made at this furnace. The stack is 55 x 12 ft. and has one cast iron pipe stove.

FOUNDRIES.

The Globe Malleable Iron & Steel Company, Syracuse, N. Y., has had plans prepared for a drop forge plant and machine shop, 60 x 270 ft., one story, of steel and brick, which it will erect on Greenway avenue.

The Sharon Foundry Company, Sharon, Pa., has the foundation completed for its new 20-ton open hearth furnace and will commence on the brickwork within a week. It expects to have the furnace ready to operate about April 15. This will give the concern two 20-ton furnaces.

The Perry Steel Company, Buffalo, N. Y., has been incorporated with a capital stock of \$100,000. The plant will be located at Buffalo, and the product will be high grade small steel castings, made by the converter process, the production of which will be started early in May. Practically all the equipment for the plant has already been contracted for. G. W. Perry of Philadelphia, Pa., is president.

The Acme Steel & Malleable Iron Works, Buffalo, N. Y., is ready to receive bids for its foundry addition, 147 x 260 ft., one and two stories, which it is to erect at its plant, Military road and the New York Central Railroad, early this spring.

The Phelps street foundry plant of the Lloyd-Booth department of the United Engineering & Foundry Company at Youngstown, Ohio, will be abandoned this spring, and the machine shop department of the works enlarged to include the present foundry building. The foundry work will be done at the Oak street department, which will probably be enlarged at an early date to meet the growing business of the company.

POWER PLANT EQUIPMENT.

The complete hydraulic equipment for the Red Cedar plant of the Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., has been ordered from the Allis-Chalmers Company, Milwaukee. It comprises one 3600-hp. generator unit operating under 48 ft. head, and placed in a hollow dam of the Amburson Hydraulic Construction Company's build, with complete hydraulic governor and 170-hp. exciter unit, also head gates, trash racks, &c. This contract was based entirely on the engineering merits of the design of the machinery, considered as a guarantee of economy in operation. It covers the first of four generator units and the first of two exciter units which are to comprise the ultimate capacity of the plant.

The Canadian Crocker-Wheeler Company, Montreal, Canada, has purchased a site of 8 acres at St. Catherines, Ont., on which are practically new buildings having a floor space of about 30,000 sq. ft. The company is installing in these buildings tools and equipment for the manufacture of electrical apparatus. It is understood that not all the necessary equipment has yet been purchased.

BRIDGES AND BUILDINGS.

The Rochester Bridge Company, Rochester, Ind., is rapidly completing its factory. Twenty electric motors have been installed, the wiring being done underground for safety.

MISCELLANEOUS.

The Hoosier Supply Company has been organized at Indianapolis, Ind., and incorporated with \$5000 capital stock, to manufacture foundry facings, supplies, &c. The directors are Frederick B. Stevens, Alfred T. Wagner and W. H. Cluff.

The Laporte Carriage Company, Laporte, Ind., has increased its capital stock from \$100,000 to \$200,000.

On March 8 the M. Lentz & Sons Bolt Works, Pittsburgh, Pa., suffered an estimated fire loss of \$150,000.

The Youngstown Armature & Construction Company, Youngstown, Ohio, incorporated some time ago under Ohio laws with a capital of \$10,000, has completed its two-story building, 45 x 50 ft., on Market street, and it is being fitted with motors and machine tools for the repair of armatures, commutators, &c. The members of the company are experienced men, having been employed in the shops and on construction work by the larger electrical manufacturers.

J. H. Wagener & Co., Youngstown, Ohio, are now furnishing architects, engineers and manufacturers with a smaller sized blue printing machine, of the single point type, which meets the needs of many drafting rooms. On their larger machine two sheets are printed at once, if desired. They report business very good and that their orders insure operations for a couple of months ahead.

The Youngstown Car & Mfg. Company, Youngstown, Ohio, reports receiving orders for charging boxes from the following

companies: American Rolling Mill Company, Middletown, Ohio; Cambria Steel Company, Johnstown, Pa., and the Ohio works of the Carnegie Steel Company, Youngstown, Ohio. A shipment was also recently made to the Midvale Steel Company, Nicetown, Pa., of seven large steel ingot cars of 65 tons capacity. Good business is being received by the company from its domestic trade and its New York office is sending in many orders for mine and plantation cars, most of which are for export.

The National Fulton Brass Mfg. Company, Detroit, Mich., will build and equip an extensive manufacturing plant at East Grand Boulevard and Chene street.

The Glass Enameling Package Company, recently incorporated at Detroit, Mich., has secured a manufacturing site on the Belt Line at Gratiot road and will build a large plant.

The Electric Heater Company, Detroit, Mich., Geo. Mitchell, manager, 72 Brush street, will build and equip a factory at the corner of Lafayette avenue and Tenth street.

The American Radiator Company is adding to its standard plant at Roseville street and the Erie Railroad, Buffalo, N. Y., a large one-story warehouse.

The Buffalo Elevator Company, recently organized at Buffalo, N. Y., by Merton D. Vanderheyden and L. D. Higgins, has established a manufacturing plant at the corner of Chicago and Perry streets for the manufacture and repair of both electric and hydraulic elevators.

The Federal Milling Company, Lockport, N. Y., has purchased waterfront property on the Niagara River at North Tonawanda, N. Y., with New York Central and Erie Railroad connections, and will erect and equip extensive flour mills and a grain elevator.

The American High Speed Chain Company has been organized at Indianapolis, Ind., and incorporated with \$25,000 capital stock, to manufacture link chains, belts, pulleys, &c. The directors are John C. Howe, William A. Rockenfield and Rollen G. Leonard.

The M. V. Cheesman Company has been incorporated at Mishawaka, Ind., as general manufacturers, with \$25,000 capital stock. The directors are M. V. Cheesman, F. S. Fetter and E. B. Moncrieff.

The Toops Automobile Hood Company has been incorporated at Indianapolis, Ind., with \$25,000 capital stock, to manufacture auto specialties. The directors are Emory D. Toops, Frank Schussler and Charles B. Clarke.

The Beaumont Iron Works, Beaumont, Texas, has been incorporated with an authorized capital stock of \$100,000, all paid in and issued. The new company has purchased the plant of the old Beaumont Iron Works of that city, which was recently sold at receiver's sale, including materials and supplies on hand, together with 2½ acres of land in the western part of the city with large car erecting shops thereon. The following are the officers of the new company: C. L. Wallis, president; L. J. Black, vice-president; C. T. Helsig, secretary; L. J. Black, treasurer and manager. Mr. Black, who was formerly superintendent of the Higgins Oil & Fuel Company, will be in active charge of the business, assisted by C. T. Will, who for a number of years was superintendent of the Neches Iron Works.

Deere & Co., Moline, Ill., have presented to the City Council petitions for switch tracks and tunnel rights to carry out large extensions to their plant. Plans now under consideration by the company provide for the extension of the fitting shop by the erection of an addition, 60 x 250 ft., together with an addition to the blacksmith shop, 150 x 250 ft. Besides these two buildings the company is contemplating the erection of several others. It is stated that it will require about three years of continuous development to complete all the buildings planned, which will double the capacity of the plant.

The Union Switch & Signal Company, Pittsburgh, Pa., held its annual stockholders' meeting March 8. The following directors were elected: George Westinghouse, William McConway, George C. Smith, Thomas Rodd, H. C. Prout, J. J. Donnell and John F. Miller.

The Vulcan Steam Shovel Company, Toledo, Ohio, has been sold to Howard P. Eells of Cleveland, president of the Bucyrus Steam Shovel Company, South Milwaukee; George F. Steedman, president of the Curtis Mfg. Company, St. Louis, and a few associates, the majority of the stock having passed to the hands of the two men named. Mr. Eells announces that the plant will continue to be run under its present name and entirely independent of the Bucyrus Steam Shovel Company. The price paid for the property is understood to have been about \$500,000.

The W. G. Mitchell Spring Works, Johnstown, Pa., is seriously considering the installation of necessary equipment for the manufacture of elliptical springs to supply the automobile trade. Figures are now being taken on the needed equipment.

All the offices, including the engineering department, of the Independent Steel & Wire Company, have been removed from the House Building, Pittsburgh, Pa., to Kenova, W. Va., where the company's wire and wire nail works are located.

New Publications.

Blast Furnace Practice. By J. James Morgan. Cloth bound, viii + 46 pages, $4\frac{3}{4} \times 7\frac{1}{4}$ in. Published by Charles Griffin & Co., Ltd., London, and J. B. Lippincott Company, Philadelphia. Price, 75 cents, net.

While not of pretentious appearance and containing but three illustrations, this little book has a place. The author may not be right in saying that the treatment of the subject from a practical standpoint has been neglected, but he did well to prepare this compendium of practical suggestions for the use of the beginner, the technical student, the engineer and others engaged in iron and steel manufacture. Mr. Morgan does not go into the construction of the furnace, the development of its equipment, or into the changes that have come so rapidly in the past 20 years and that have had so much to do with the increase of blast furnace output. He deals almost entirely with the stack itself, its contents and its operation as a machine for the reduction of iron ore. Naturally the treatment is condensed. The statements are simple and direct. In turn the author discusses iron ores, fuel, flux, slags, quantity of slag, burden, the blast, ore mixing, amount and composition of the iron, calculation of flux, heating the blast, drying the furnace, filling the furnace, charging the furnace, descent of the charge, flushing, tapping, hard tapping hole, running down the beds (casting), judging the temperature, controlling the temperature, temperature and the reduction of silicon, the pig iron, economy in fuel consumption, changing leaky tuyeres, obstructions, pillaring, breakouts, hot spots, scaffolds, slips, "damping down" and blowing out.

It does not matter greatly that the author refers to the classes of pig iron and to ores as they are known in British blast furnace practice. What he has aimed to give is a condensed statement of the principles and elementary facts of blast furnace operation.

The Exporters' Encyclopaedia. Sixth edition (1910). Cloth bound; 750 pages. Exporters Encyclopaedia Company, 80 Broad street, New York City. Price, \$5, including monthly correction notes and the *Exporters' Review* for the entire year.

This publication is designed to assist the exporter by giving him all details required for making shipments to any foreign country. Every practical route from the United States to every foreign country is given, showing the direct ports of call, the frequency of sailings (or sailing days), the ports reached by trans-shipment and how interior cities are reached. The book tells whether the shipper can get a through bill of lading, or, if not, which is the nearest port to which a through bill of lading can be obtained; whether any consular regulations must be observed and their exact cost; what the transportation companies require as to bills of lading, payment of freight, and, in fact, answers every question that comes up in making an export shipment.

The Utility of All Kinds of Higher Schooling. By R. T. Crane. Cloth bound; pages, 331, $5\frac{3}{4} \times 7\frac{1}{4}$ in. Distributed through A. C. McClurg & Co., Chicago. Price, \$1 net.

Mr. Crane's views on higher education are well known and he has had a vigorous, if not virulent, way of expressing them in his running attack of several years on high schools and colleges. In 1902 he published part I. of the present book and in 1903 issued it as a second edition, his thesis then being the uselessness of an academic or classical education for young men who have to earn their own living, and who expect to pursue a commercial or industrial career. In part II. of the book before us the author goes farther into the subject and makes his familiar charge of worthlessness cover technical schools, agricultural colleges, manual training high schools, medical schools

and various other classes of institutions. "Fraud," "curse," "imposition" are favorite words with Mr. Crane in his bombardment of these schools, whose training, he would have us know, "does not make either brains or ability." The expense of higher education to this nation, we are told, "must be at least \$100,000,000 a year, and this enormous sum is literally thrown away, much to the injury of the country and its people. For this vast waste of money means blood drawn right from the people, blankets taken from their beds, food from their tables, coal from their cellars, clothing from their backs—all in the line of sacrifice on the altar of higher education." And then follows this:

I think it is high time that the American people realized this, for I believe if they once become fully aroused on this matter they would take steps to compel the higher educators to go to work and earn an honest living. If the professors can tell us how to raise corn or build bridges or dig tunnels or run factories or manage stores, then in the name of common sense let us give them a chance to show us how these things should be done.

If tunnels and bridges and stores and factories are the end of life, and men just a means to that end, Mr. Crane may have found out something that has been overlooked. There is, no doubt, a waste in modern educational methods; doubtless a good many young men and young women are spending time on studies that are not fitting them for practical life or for the work in which they are to find their livelihood. But sweeping denunciation of all higher education and higher educators is not convincing, and, speaking generally, we fail to find in such facts as Mr. Crane's investigations have yielded, a sufficient basis for the conclusions he appears to have reached.

Labor Notes.

In the sympathetic strike in Philadelphia, agreements with employers by some of the unions have been violated, this being particularly noticeable in stove foundries operated by members of the National Stove Founders' Defense Association working under agreement with the Iron Molders' Union of North America, in connection with which it must be stated that the officers of the latter organization have ordered its striking members to return to work.

The molders and coremakers employed in the heavy foundries in Cleveland have demanded an increase in wages from \$3 to \$3.50 for a nine-hour day. They ask for a conference by March 10, and the adoption of the new scale on April 1.

The Trussed Concrete Steel Company, Detroit, Mich., manufacturer of the Kahn system of reinforced concrete, is building an addition to its factory at Youngstown, Ohio, 70×230 ft., one story. It will be equipped with crane runway and heavy presses. The walls and roofs are to be made of the company's Hy-Rib, coated with cement, and the windows will be equipped with its United steel sash. Tracks will run through the building. All the contracts for the construction and equipment of the plant have been placed. The new factory will be devoted largely to the manufacture of the company's United steel sash.

The C. & G. Cooper Company, Mount Vernon, Ohio, has received an order from the Minnesota Steel Company, Duluth, Minn., for a complete electrical unit of 750 hp. capacity, including a cross compound Corliss engine and a 500-kw. direct current generator. This unit will run 100 r. p. m. It will furnish the current required for the construction work at the Duluth plant and will be the initial power installation on the property of this company, which is a subsidiary of the United States Steel Corporation.

Pig Iron Production.

An Increasing Rate in February.

Per Diem Output 1468 Tons More Than in January.

The production of coke and anthracite iron in February, with three days less than in January, was 2,397,254 tons, against a total for January of 2,608,605 tons. The daily rate was thus 85,616 tons last month, or 1468 tons more than in January, the steel works furnaces contributing 676 tons and the merchant furnaces 792 tons of this daily increase. On March 1 311 furnaces were in blast, against 313 on February 1, but the weekly capacity of furnaces active at the beginning of this month was 7400 tons more than on February 1, or 593,979 tons against 586,512 tons. The active capacity March 1 is thus close to that at the beginning of the year, which was 595,216 tons a week.

Among the furnaces blown in last month was a second new stack at Aliquippa, Pa., and the new one at Hubbard, Ohio.

Production of Steel Companies.

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are indicated in the first three columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.	Total production.	Spiegeleisen and ferromanganese.	1909.	1910.
January	664,415	1,117,823	1,773,201	12,325	19,538
February	745,802	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,553	1,773,201	23,743	.....
April	725,548	1,093,092	1,773,201	22,478	.....
May	759,674	1,256,448	1,773,201	20,834	.....
June	717,689	1,365,527	1,773,201	16,516	.....
July	798,639	1,508,762	1,773,201	17,613	.....
August	897,052	1,591,991	1,773,201	22,313	.....
September	933,514	1,660,839	1,773,201	28,148	.....
October	996,481	1,769,094	1,773,201	25,384	.....
November	981,167	1,689,994	1,773,201	23,376	.....
December	1,090,339	1,768,799	1,773,201	20,791	.....

February Output by Districts.

The table below gives the production of all coke and anthracite furnaces in February and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	Oct. (31 days)	Nov. (30 days)	Dec. (31 days)	Jan. (31 days)	Feb. (28 days)
New York....	184,075	178,783	166,725	172,260	156,470
New Jersey....	32,778	36,444	35,711	28,856	26,102
Lehigh Valley....	68,339	66,703	65,951	62,601	54,028
Schuylkill Val....	56,251	56,463	57,585	60,624	53,996
Lower Susquehanna and Lebanon Val....	75,542	71,463	75,737	69,413	64,054
Pittsburgh dis....	594,652	573,439	617,952	603,261	541,791
Shenango Val....	164,564	157,984	157,901	159,418	137,095
West. Penn....	140,338	139,168	146,732	141,495	133,266
Md., Va. and Kentucky....	74,327	75,661	75,450	72,425	66,454
Wheeling dis....	139,832	135,274	139,496	124,556	120,036
Mahoning Val....	220,093	232,230	233,147	232,381	220,779
Central and North. Ohio....	213,585	208,559	217,217	217,681	201,462
Hocking Valley, Hanging Rock and S.W. Ohio....	39,921	42,735	48,163	49,658	42,876
Mich., Minn., Mo., Wis., Colo....	68,709	62,088	67,626	70,989	65,363
Chicago dis....	316,673	284,725	314,634	333,892	322,196
Alabama....	175,892	184,291	177,568	170,143	154,337
Tennessee, Georgia and Texas....	33,970	41,498	38,085	38,952	36,949
Totals....	2,599,541	2,547,508	2,635,680	2,608,805	2,397,254

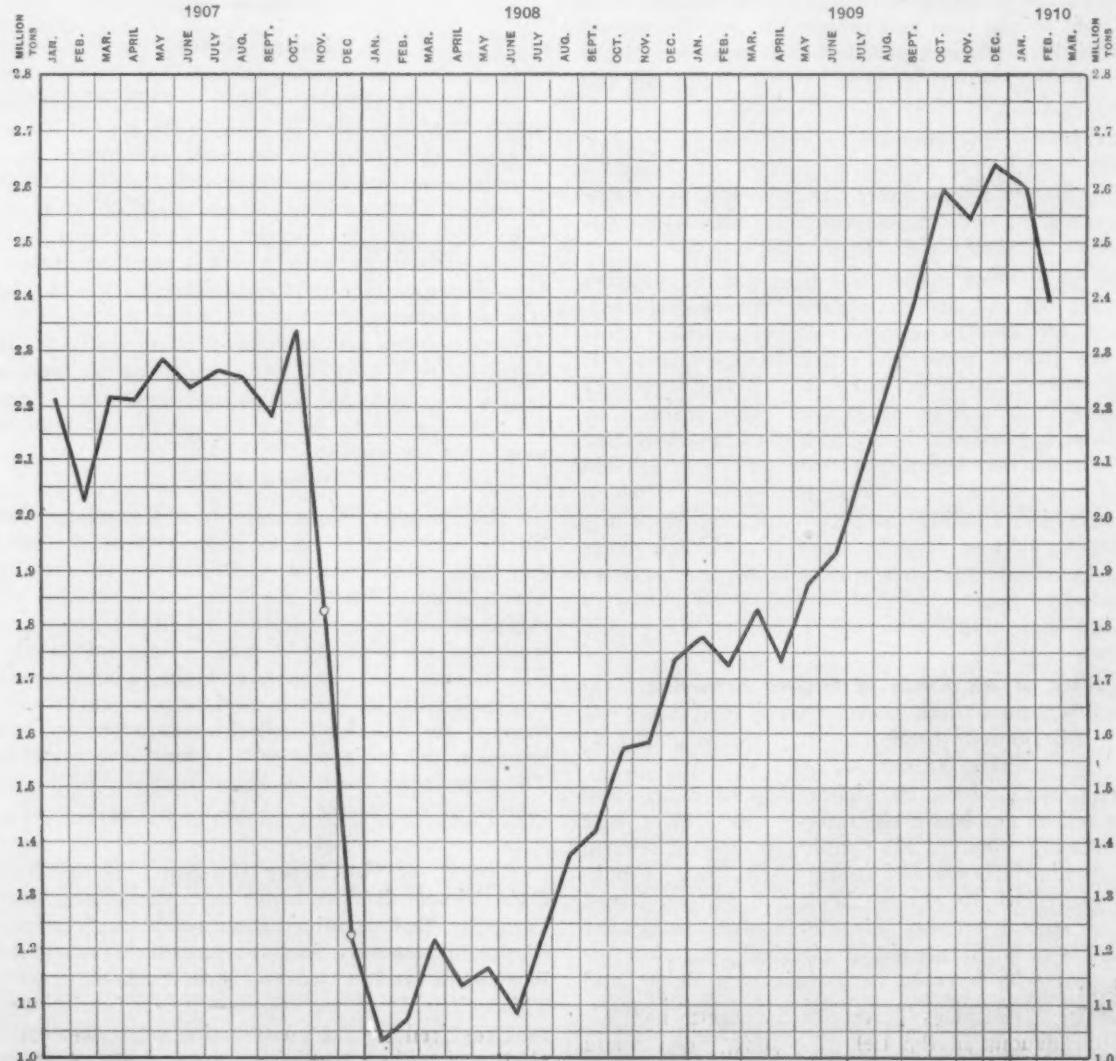


Diagram of Coke and Anthracite Pig Iron Production in the United States from January, 1907, to February, 1910, Inclusive.
(The dip of the curve for February this year is due to its being a 28-day month, the daily rate of production having been nearly 1500 tons more than in January.)

Daily Rate of Production.

The daily rate of production of coke and anthracite pig iron by months, beginning with February, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
February, 1909.....	38,367	22,609	60,976
March.....	36,811	22,421	59,232
April.....	36,436	21,526	57,962
May.....	40,531	20,222	60,753
June.....	45,507	19,149	64,656
July.....	48,670	19,123	67,793
August.....	51,354	21,192	72,546
September.....	55,361	24,146	79,507
October.....	57,067	26,789	83,856
November.....	56,333	28,584	84,917
December.....	57,058	27,964	85,022
January, 1910.....	57,200	26,948	84,148
February.....	57,876	27,740	85,616

Capacity in Blast March 1 and February 1.

The following table shows the weekly capacity of furnaces in blast March 1 and February 1, the furnaces blown in in February being rated on the records of previous performance:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	March 1.		February 1.	
		Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York:					
Buffalo.....	16	16	35,845	16	36,465
Other New York.....	7	3	4,363	3	3,416
New Jersey.....	8	5	6,525	5	6,517
Spiegel.....	2	0	0	0	0
Pennsylvania:					
Lehigh Valley.....	23	14	12,420	15	13,792
Spiegel.....	3	3	896	2	546
Schuylkill Valley.....	15	9	12,955	11	14,364
Low. Susquehanna.....	7	7	8,358	7	8,271
Lebanon Valley.....	10	9	7,629	9	7,406
Pittsburgh dist.....	49	46	134,902	47	131,901
Spiegel.....	3	3	2,908	1	875
Shenango Valley.....	20	16	32,348	18	35,987
West. Penn.....	27	19	32,280	19	31,330
Maryland.....	4	3	6,552	3	6,436
Wheeling dist.....	14	11	26,408	12	28,126
Ohio:					
Mahoning Valley.....	22	21	53,250	21	54,124
Central and North.....	21	20	50,365	20	49,154
Hocking Val., Hang-ing Rock and S. W. Ohio.....	15	12	10,650	12	11,214
Illinois and Indiana.....	31	27	76,125	28	74,065
Spiegel.....	2	2	1,624	2	1,337
Michigan, Wisconsin and Minnesota.....	9	8	9,247	8	8,873
Colorado, Missouri and Washington.....	7	5	9,121	4	7,162
The South:					
Virginia.....	23	12	8,718	11	8,472
Kentucky.....	5	1	1,418	1	1,450
Alabama.....	46	25	38,585	26	36,729
Tennessee.....	18	13	10,187	12	8,491
Georgia and Texas. 4	1	1	350	0	0
Totals.....	411	311	593,979	313	586,512

Statistics of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1907, the figures representing gross tons:

Capacity per week.	Capacity per week.
March 1.....	593,979
February 1.....	586,512
January 1, 1910.....	595,216
December 1, 1909.....	598,216
November 1.....	593,608
October 1.....	505,606
September 1.....	525,037
August 1.....	488,742
July 1.....	463,029
June 1.....	446,096
May 1.....	412,010
April 1.....	409,217
March 1.....	420,807
February 1.....	414,497
January 1, 1909.....	401,994
December 1, 1908.....	381,102
November 1.....	362,685
October 1.....	337,925
September 1.....	318,112
August 1.....	284,590
July 1.....	264,452
June 1.....	259,284
May 1.....	268,674
April 1.....	264,890
March 1.....	267,437
February 1.....	241,925
January 1, 1908.....	235,152
December 1, 1907.....	347,372
November 1.....	491,436
October 1.....	511,397
September 1.....	507,768
August 1.....	513,471
July 1.....	528,170
June 1.....	523,220
May 1.....	524,538
April 1.....	496,456
March 1.....	511,035
February 1.....	492,359
January 1, 1907.....	507,397

Changes in the Active List.

Among furnaces blown in last month were one Palmerston in the Lehigh Valley, one new Aliquippa in the Pittsburgh district, Colonial and Punxsutawney in western Pennsylvania, Princess in Virginia, Benwood in the Wheeling district, one Hubbard in the Mahoning Valley, one Pueblo in Colorado, Gadsden in Alabama, La Follette in Tennessee and Rome in Georgia (March 1).

The list of furnaces blown out last month includes one Hokendauqua in the Lehigh Valley, Temple and Tidewater in the Schuylkill Valley, Alice and New Castle No. 2 in the Shenango Valley, one Cambria and

Saxton in western Pennsylvania, Mingo No. 4 and Belmont in the Wheeling district, Ohio No. 3 in the Mahoning Valley, one Joliet (March 1) in Illinois, and one Bessemer in Alabama. In Alabama No. 1 Ironaton was blown out and No. 2 Ironaton was blown in. At the Ensley plant No. 1 stack was blown out February 22 and No. 2 stack was blown in February 5.

The Curve of Pig Iron Production.

The curve of pig iron production for the past three years is shown in the accompanying chart. The figures plotted in the chart, giving production of coke and anthracite pig iron by months, are as follows:

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January.....	2,205,607	1,045,250	1,797,560	2,608,605
February.....	2,045,068	1,077,740	1,707,340	2,397,234
March.....	2,226,457	1,228,204	1,832,194	—
April.....	2,216,558	1,149,602	1,738,877	—
May.....	2,295,505	1,165,688	1,883,330	—
June.....	2,234,575	1,092,131	1,930,866	—
July.....	2,255,600	1,218,129	2,103,431	—
August.....	2,250,410	1,359,831	2,248,930	—
September.....	2,183,487	1,418,998	2,385,206	—
October.....	2,336,972	1,567,198	2,599,541	—
November.....	1,828,125	1,577,854	2,547,508	—
December.....	1,234,279	1,740,912	2,635,680	—

The Philadelphia Foundry Foremen.—The regular monthly meeting of the Associated Foundry Foremen of Philadelphia and Vicinity was held in the Odd Fellows' Temple, Philadelphia, on the evening of March 8, Clarence R. Brown, president, occupying the chair. The following applications for membership were presented and favorably acted upon: Active member, Henry Saring, Kitson Light Company, Philadelphia; associate members, J. H. Bing and H. B. Taylor, Jr., representing Pettinos Brothers, Bethlehem, Pa. The paper presented for discussion was on "The High Cost of Living," by Dr. E. E. Brown, Philadelphia. This subject was presented in its various phases, and was followed by an active discussion, in which Thomas Devlin, Howard Evans, George M. Benkert, C. R. Brown, D. M. Kittenger, George C. Davis, Thomas H. Livezey, Joseph Whitehead and others took part.

The Pittsburgh Foundrymen's Association.—The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel on the evening of March 7. The subject for discussion was "Reduction of Foundry Insurance," and the meeting was addressed by S. G. Walker of the Senior Mutuals Insurance Company, and C. A. Anderson of the Pittsburgh Valve, Foundry & Construction Company. It is the belief of foundrymen generally that rates of insurance on foundries are too high, and strong efforts are to be made to bring about a reduction.

The Pittsburgh Traffic Club.—The annual dinner of the Traffic Club of Pittsburgh will be held in the Fort Pitt Hotel in that city on Friday evening, March 18. The number of guests is limited to 500. The speakers include Walter D. Hines of New York, chairman of the Executive Committee of the Atchison, Topeka & Santa Fé Railway Company; Chancellor James R. Day of the Syracuse University, Syracuse, N. Y.; Robert Mather, chairman of the Westinghouse Electric & Mfg. Company, and Rabbi J. Leonard Levy of Pittsburgh.

The Leetonia Boiler Company, Leetonia, Ohio, has recently completed some large annealing boxes for the following: American Steel & Wire Company, Cleveland, Ohio, four welded steel boxes, 15 ft. long, 28 in. wide and 42 in. high; Carnahan Sheet & Tin Plate Company, Canton, Ohio, a large steel annealing box, 10 ft. long, 44 in. wide and 5 ft. high.

The Spencer Commercial Club, Spencer, Ind., is raising a \$20,000 factory fund to encourage the location of industries in that city.

THE IRON AND METAL TRADES

Railroad Inquiry Growing.

Pig Iron Output Larger and Prices Drag.

Railroads are making larger demands upon iron and steel works, and this is the most significant feature in the situation. The need of new equipment is becoming more imperative, particularly in the West; the chief difficulty is that deliveries from car works cannot be had before midsummer. Estimates of pending business, representing the inquiries of a dozen roads, show that 20,000 to 25,000 cars are likely to be bought in the near future, while an equal number are under consideration, without immediate prospect of being placed. The number of bridges placed by railroads recently is noteworthy, 14 such contracts amounting to 10,000 tons having been closed in the past 10 days, while 5000 tons additional is under inquiry. Chicago reports inquiries for 100,000 tons of plates and shapes from car companies. At Buffalo a sale of 15,000 tons has been made for cars for the Merchants' Despatch.

Returns to *The Iron Age* show a production of 2,397,254 gross tons of coke and anthracite pig iron in the 28 days of February, against 2,608,605 tons in January. The daily rate in February was thus 1468 tons greater than in January, and the net result for the month was apparently a further accumulation of iron in furnace yards, though not an important one. The weekly capacity of furnaces active March 1 was 7400 tons more than on February 1, or 593,979 tons, against 586,512 tons. There is no indication of furnaces going out for any reason other than repairs, though the list of such furnaces has been lengthening of late.

There has been pig iron buying in spots in the past week, but nothing like a movement. The Cambria Steel Company bought 10,000 tons of Bessemer on terms equivalent to \$17.75 at Valley furnace, and another steel company took 7000 tons on the same basis. The resale basic iron recently offered at low prices in the Pittsburgh district is now reported to have been taken up and the market is firmer at \$16, Valley furnace, while \$16.25 is asked by some sellers.

No additional Bessemer iron has been bought by the Steel Corporation, and it is not expected to be a buyer in the immediate future, except in case of accident to some of its furnaces.

Less is heard of low priced lots of Southern certificate iron, but sales are still made at \$13, Birmingham, for No. 2. At Chicago, the recent warrant iron offerings are reported to have been largely absorbed and the feeling is better. Eastern pipe foundries have bought considerable iron, much of it of equivalent analysis to gray forge, at \$16, delivered on the Delaware River. One pipe company is in the market for 18,000 tons, mostly Southern iron.

The disposition has appeared in some quarters to make the prices reached on early shipment pig iron apply to later months. A strong buying movement might easily change all this, but under present conditions, as shown in bids made on the 15,000 tons for electrical interests at Pittsburgh, low prices are available for extended delivery.

In nearly all finished materials there is evidence of an improved feeling, though on some recent business prices have been shaded on shapes and plates, and prices of iron bars are coming nearer to a parity with steel.

A sale of 10,000 tons of rails has been made to a Southwestern road, and the New Haven has come into the market for 15,000 tons of open hearth rails. Competition of domestic mills for export rail business has been keen of late. Foreign rail mills have taken some good orders, a Russian mill receiving a contract for 10,000 tons from Brazil. A 20,000-ton inquiry from

Manchuria, for delivery at Dalny, is pending. British rails have sold at \$26, at mill.

Next to bridge work, the important feature in structural lines is the demand from manufacturing companies for new buildings and extensions. In the metal working trades a good indication of conditions is statistics showing 40 per cent. more men employed than at this time last year.

Cast iron pipe works have good prospects for spring business. The leading maker took the Chicago contract for 5600 tons last week and the Cleveland contract for 3400 tons.

The distribution of wire products is more active, and indications point to a heavier movement in the next two weeks.

Copper sales are estimated at 50,000,000 lb. in the past week, and electrolytic has advanced to 13.50c.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar. 9	Mar. 2	Feb. 9	Mar. 10
PIG IRON, Per Gross Ton :	1910.	1910.	1910.	1909.
Foundry No. 2, standard, Philadelphia	\$18.00	\$18.00	\$18.75	\$16.50
Foundry No. 2, Southern, Cincinnati	16.50	16.75	17.25	15.75
Foundry No. 2, local, Chieng..	18.50	18.50	19.00	16.50
Basic, delivered, eastern Pa....	18.50	18.50	18.50	16.00
Basic, Valley furnace.....	16.00	16.00	16.50	15.00
Bessemer, Pittsburgh.....	18.65	18.90	19.65	16.40
Gray forge, Pittsburgh.....	16.15	16.15	17.15	14.90
Lake Superior charcoal, Chicago.	19.50	19.50	19.50	19.50

BILLETS, &c., Per Gross Ton :

Bessemer billets, Pittsburgh.....	27.50	27.50	27.50	23.00
Forging billets, Pittsburgh.....	32.00	32.00	32.00	....
Open hearth billets, Philadelphia	30.60	30.60	30.60	24.20
Wire rods, Pittsburgh.....	33.00	33.00	33.00	33.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton :

Steel rails, melting, Chicago....	16.50	16.50	16.50	13.00
Steel rails, melting, Philadelphia	16.50	16.50	16.50	13.50
Iron rails, Chicago.....	19.00	19.00	19.00	17.75
Iron rails, Philadelphia.....	20.00	20.00	20.00	17.00
Car wheels, Chicago.....	17.00	17.00	18.00	14.75
Car wheels, Philadelphia.....	16.75	16.75	16.75	14.00
Heavy steel scrap, Pittsburgh....	16.50	16.50	17.50	14.25
Heavy steel scrap, Chicago.....	15.00	15.00	15.50	12.50
Heavy steel scrap, Philadelphia.	16.50	16.50	16.50	13.50

FINISHED IRON AND STEEL,

Per Pound :	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.	1.57½	1.60	1.00	1.42
Common iron bars, Chicago....	1.55	1.55	1.60	1.40
Common iron bars, Pittsburgh..	1.65	1.65	1.70	1.40
Steel bars, tidewater, New York.	1.61	1.61	1.66	1.36
Steel bars, Pittsburgh.....	1.45	1.45	1.50	1.20
Tank plates, tidewater, New York.	1.71	1.71	1.71	1.46
Tank plates, Pittsburgh.....	1.55	1.55	1.55	1.30
Beams, tidewater, New York....	1.66	1.66	1.66	1.46
Beams, Pittsburgh.....	1.50	1.50	1.50	1.30
Angles, tidewater, New York....	1.66	1.66	1.66	1.46
Angles, Pittsburgh.....	1.50	1.50	1.50	1.30
Skelp, grooved steel, Pittsburgh.	1.50	1.50	1.50	...
Skelp, sheared steel, Pittsburgh.	1.60	1.60	1.60	...

SHEETS, NAILS AND WIRE,

Per Pound :	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.40	2.40	2.40	2.30
Wire nails, Pittsburgh*.....	1.85	1.85	1.85	1.95
Cut nails, Pittsburgh.....	1.85	1.85	1.80	1.80
Barb wire, galv., Pittsburgh*...	2.15	2.15	2.15	2.40

METALS, Per Pound :

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	13.75	13.75	13.75	13.00
Electrolytic copper, New York..	13.50	13.37½	13.50	12.62½
Spelter, New York.....	5.73	5.75	6.12½	4.80
Spelter, St. Louis.....	5.58	5.60	5.87½	4.65
Lead, New York.....	4.55	4.65	4.70	3.97½
Lead, St. Louis.....	4.70	4.50	4.55	3.82½
Tin, New York.....	32.45	32.87½	32.60	28.65
Antimony, Hallett, New York..	8.25	8.25	8.25	7.75
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York...	\$3.84	\$3.84	\$3.84	\$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.50c. to 1.55c., net; I-beams over 15 in., 1.65c., net; H-beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, 1/4 in. and up, 1.60c., net; angles over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than 1/4 in., 1.75c., base, half extras, steel bar card; tees, 3 in. and up, 1.65c., net; zees, 3 in. and up, 1.60c., net; angles, channels and tees, under 3 in., 1.50c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, 3/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.55c. to 1.60c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, 3/4-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered 1/4-in. plates. Plates over 72 in. wide must be ordered 1/4-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3 1/2-in. take the price of 3 1/2-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under 1/4-in. to and including 3 1/2-in. on thinnest edge.....	\$0.10
Gauges under 3 1/2-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 to 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; Nos. 27, 2.35c.; Nos. 28, 2.40c.; Nos. 29, 2.45c.; Nos. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; Nos. 27, 3.30c.; Nos. 28, 3.50c.; Nos. 29, 3.60c.; Nos. 30, 3.85c. Painted roofing sheets, No. 28, \$1.70 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2 1/2-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe which went into effect January 1:

	Steel.	Iron.		
	Black.	Galv.	Black.	Galv.
1/2 and 1/4 in.	70	54	65	.
5/8 in.	71	57	66	52
3/4 in.	74	62	69	57
5/8 to 6 in.	78	68	73	63
7 to 12 in.	72	57	67	52
Plugged and Reamed.				
1 to 4 in.	76	66	71	61
Extra Strong, Plain Ends.				
1/2 to 3/4 in.	63	51	58	46
1/2 to 4 in.	70	58	65	53
4 1/2 to 8 in.	66	54	61	49
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
1/2 to 8 in.	59	48	54	43

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1 1/2 in.	49	43
1 1/2 to 2 1/2 in.	61	43
2 1/2 in.	63	48
2 1/2 to 5 in.	69	55

6 to 18 in..... 61 43
2 1/2 in. and smaller, over 18 ft., 10 per cent. net extra.
2 1/2 in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, \$33.

Steel Rivets.—Structural rivets, 3/4-in. and larger, 2.15c., base; cone head boiler rivets, 3/4-in. and larger, 2.25c., base; 5/8-in. and 11 1/2-in. take an advance of 15c., and 5/8-in. and 9 1/2-in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of \$2 to \$3 a ton to the small trade.

Pittsburgh.

PARK BUILDING, March 9, 1910.—(By Telegraph.)

Pig Iron.—The market is showing more life, inquiries being more numerous, while some good sized blocks of Bessemer and basic have been sold. The Cambria Steel Company has bought through a dealer 10,000 tons of Bessemer, for March and April, to come from the Sharpsville Furnace Company, which makes about 150 tons a day. The storage facilities of the furnace company are limited, and as it had piled up practically all the iron it could take care of there was a question of shutting down the furnace or moving some iron. The Cambria Company agreed to take the iron in March and April, although not in need of it now, and in consideration of this was allowed interest charge of 27 cents a ton, the iron thus netting the seller about \$17.75 a ton. The Lackawanna Steel Company has also bought 7000 tons of Bessemer for prompt shipment on the same terms as the Cambria. Reports that the Republic Iron & Steel Company has bought 5000 to 10,000 tons of Bessemer are incorrect; it has not bought any iron for several months and will probably not buy any. There are also reports of sales of basic iron in fairly large lots, details of which are not ready to be given out. The Westinghouse Electric & Mfg. Company has not yet closed for the purchase of 15,000 tons of foundry iron, inquiries for which were sent out about 10 days ago, but will likely do so this week. It is understood that some low prices have been quoted on this inquiry, although for delivery in second half. We quote Bessemer at \$17.75; basic, \$16 to \$16.25; malleable Bessemer, \$16.25 to \$16.50; No. 2 foundry, \$16.25, and gray forge, \$15.25, all at Valley furnace, carrying a rate of 90 cents a ton for delivery in the Pittsburgh district.

Steel.—New inquiries for Bessemer and open hearth steel billets and sheet and tin bars are more plentiful and prices are firm. We note sales of 700 to 800 tons of Bessemer sheet bars at about \$28.50, and 1000 to 1200 tons of open hearth sheet bars at \$29.50, Pittsburgh, full freight to destination added. We quote 4 x 4 in. Bessemer billets at \$27.50 to \$28; Bessemer sheet and tin bars, \$28.50 to \$29; 4 x 4 in. open hearth billets, \$29 to \$29.50; small billets, \$30 to \$31; sheet and tin bars, \$29 to \$29.50, and forging billets, \$32 to \$33, f.o.b. maker's mill.

(By Mail.)

The encouraging feature in the situation is the heavy inquiry from the railroads for steel cars and other equipment. It is estimated that orders for 50,000 to 60,000 cars are under negotiation, and roads not yet in the market are getting ready to ask for bids in the building of a large number of steel cars and other equipment. It is also reliably stated that some large inquiries for rails for this year delivery will soon come out. The one thing needed to insure good business for this year was for the railroads to commence to buy, and these inquiries for cars, locomotives and other supplies indicate strongly that the buying movement by the railroads has actually started. The pig iron market is more active and prices are reported firmer. A speculative lot of 5000 to 6000 tons of basic held by a local dealer has been cleaned up, having been bought by two or three consumers, and with this iron out of the way the basic market is stronger. A western Pennsylvania steel company is credited with having bought about 10,000 tons of Bessemer from a Shenango Valley furnace interest at \$17.75, at furnace. Some other small inquiries for Bessemer are in the market, but the statement that the Steel Corporation had bought an additional block of Bessemer iron is untrue. The Corporation has no option on iron, but may possibly buy later on. The belief is general that prices of pig iron are as low as they will go, and that an advance is due. Open hearth steel billets and sheet and tin bars are still very scarce, and small lots of open hearth bars have sold at \$29.50, at mill, for prompt shipment. Specifications on finished iron and steel have been coming in quite freely so far this month, and the fact that a fortnight of good weather has brought out large inquiries indicates strongly the heavy business that will come out when favorable weather is here to stay. Already a car shortage exists in the Pittsburgh district and shipments are greatly hampered.

Muck Bar.—A local maker reports a sale of some 200 tons of all pig iron muck bar at about \$29.50, Pittsburgh. There is not much new inquiry. We quote best grades of muck bar made from all pig iron at \$29.50 to \$30, Pittsburgh.

Rods.—While there is not much new inquiry for rods, the market is firm, the available supply of rods for prompt shipment being limited. A leading local producer is not quoting on rods for the open market, needing its entire output for its own wire mills. We quote Bessemer, open hearth and chain rods at \$33, Pittsburgh.

Skelp.—A more active inquiry for skelp is observed, particularly for grooved and sheared iron. The mills rolling this material are very busy and have a good deal of work ahead. With the return of favorable weather pipe laying will again become active, and this will mean a regular demand on the skelp mills for their products. For ordinary widths and gauges we continue to quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—Official announcement is made by A. C. Dinkey, president of the Carnegie Steel Company, that work will be started at once on the building of a mill at the Edgar Thomson plant to make splice bars. It will have a capacity of 400 to 500 tons a day, and it is the intention of the company, when the new mill is finished, to make all its splice bars at Edgar Thomson instead of at Duquesne, where they are now made. The report that one or two of the present rail mills at Edgar Thomson would be dismantled is absolutely untrue, as there is no intention of throwing out any of the present mills. The Carnegie Steel Company had a good month in February in standard sections, its new orders and specifications against contracts in that month being the largest, with the exception of one month, in the past two years. It entered orders last week for 3100 tons of light rails and is bidding with the car companies on the axles for nearly 20,000 cars. Some heavy orders for track bolts have recently been placed and others are about to be given out. We quote steel axles at 1.75c. to 1.80c. and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at \$28, at mill.

Plates.—An encouraging feature of the plate situation is the large number of inquiries for cars. The Harriman lines are in the market for 1500 box, 1500 automobile, 1000 flat, 1000 stock, 1000 gondola, 200 hopper and 500 caboose cars. The Louisville & Nashville is inquiring for the underframes for 800 to 1000 gondola, stock and hopper cars; the Southern Pacific for passenger equipment, consisting of 75 passenger cars, 50 chair cars, 30 baggage and 35 postal cars, all to be of steel; the Missouri, Pacific & Kansas for 1000 box, 300 furniture, 200 automobile, 500 gondola, 100 flat and 50 caboose cars; the Chicago, Milwaukee & St. Paul for 60 coke cars; the Chilian States Railway for 50 30-ton and 30 20-ton cars; the Crescent Tank Line for 100 to 125 tank cars. The Pressed Steel Car Company and the Standard Steel Car Company are running their works to practically full capacity. The Pressed Steel Car Company shipped out on Monday 103 cars. It is now making at its Wood Run and McKees Rocks works about 90 cars per day, and expects in the near future to be turning out over 100 steel cars per day, which is its normal capacity. A large tonnage in plates will be needed for water lines that are coming up, but which are not yet ready to figure on. The boiler makers and steel plate constructors are turning out a large amount of work and using quantities of plates. The mills are pretty well filled up for the next two or three months and have little capacity for new work this side of July. We quote $\frac{1}{4}$ -in. and heavier plates at 1.55c. in large lots and 1.60c. in small lots, f.o.b. at mill.

Structural Material.—General conditions in the structural trade are more active than for some time. The American Bridge Company has taken 1300 tons of bridge work for the Cincinnati, Hamilton & Dayton Railroad and 5500 tons for new steel buildings for the American Steel & Wire Company at Birmingham, Ala. The McClintic-Marshall Construction Company has taken about 1000 tons for new buildings for the Garry Iron & Steel Company, at Youngstown, Ohio; 500 tons of bridge work for the Chicago, Burlington & Quincy Railroad, and about 50 tons for steel buildings for the Cincinnati-Bickford Tool Company at Cincinnati. The largest local prospective job in the market is the Point Bridge, connecting lower Pittsburgh with the North Side, and which is estimated will take 8000 tons. Bids for the masonry for this bridge will be asked for in a short time. There is also a talk of a bridge across the Ohio River from Aliquippa, where the new works of the Jones & Laughlin Steel Company are located, to Economy, Pa. We quote beams and channels up to 15-in. at 1.50c., minimum, for desirable orders, and 1.55c. to 1.60c. for general current orders.

Tin Plate.—Before the end of this year there will be a very large increase in tin plate capacity, and the question is being asked whether there will be enough demand to take it up. The Phillips Sheet & Tin Plate Company started its new plant at Weirton, W. Va., last week, containing 10 hot mills, and the first 12-mill unit of the 30-mill plant now building by the Jones & Laughlin Steel Company at Aliquippa, Pa., will probably be started in April. Active work is being started on the enormous tin plate plant to be built by the American Sheet & Tin Plate Company at Gary, Ind. This interest is now operating 186 hot tin mills and is steadily increasing its output. Practically all of the leading tin plate mills are sold up on their entire output until July. Shipments by some of the mills are being hampered to some extent by the car shortage, which has reached an acute stage. We continue to quote 100-lb. cokes at \$3.60 per base box f.o.b. Pittsburgh, for delivery up to July. Sales of good sized lots of tin plate, in one case 30,000 boxes, are reported at premiums of 5 cents to 10 cents a box over the regular price.

Sheets.—We note quite an active new demand for both black and galvanized sheets, while new business on roofing sheets is coming in more lively, due to the return of mild weather permitting outside building operations. Most of the leading sheet mills are pretty well sold up to July, and have very little room for tonnage for delivery before that month. While there are reports of some little shading in prices of corrugated roofing sheets, this is exceptional and does not exceed \$1 per ton. We note a continued scarcity in the supply of blue annealed sheets, which are still commanding premiums of \$2 to \$3 per ton for reasonably prompt delivery, sales of No. 10 having recently been made at 1.85c. to 1.90c., at mill. Regular prices are as follows: Blue annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c., and Nos. 14 and 15, 1.95c.; one-pass box annealed No. 28 black sheets, 2.40c., and No. 28 galvanized, 3.50c., at mill. We quote corrugated roofing sheets at \$1.70 per square for painted and \$3 for galvanized, $\frac{1}{2}$ -in. corrugations. Jobbers charge the usual advances over these prices for small lots from store.

Bars.—The implement makers, wagon builders and steel car interests are specifying freely against their contracts for steel bars. Deliveries by the mills to these consumers during the winter months have been very unsatisfactory. It is stated that already some feelers are out from the implement makers on their supply of steel bars for six months and also for the year beginning July 1, but, so far as we know, none of this business has been closed. Makers of iron bars report a fairly heavy demand, with specifications against contracts coming in quite freely. The recent decline in prices of mill iron has made the situation in iron bars a little easier. On contracts for delivery ahead we continue to quote steel bars, 1.45c., while on general current orders, for reasonably prompt shipment, 1.50c. to 1.55c., at mill, is being named. We quote iron bars at 1.65c. to 1.70c., Pittsburgh, full freight to destination added.

Hoops and Bands.—New orders are showing some increase, and the mills rolling hoops and bands probably have more tonnage on their books at present than for some time. Specifications against contracts continue to come in quite freely. Prices are firm, but unchanged. We quote steel hoops for forward delivery at 1.50c. to 1.60c., and for prompt shipment at 1.60c. to 1.65c., at mill. Steel bands are 1.45c. to 1.50c., on contracts, and from 1.60c. to 1.65c. for prompt shipment.

Spelter.—The market has improved to the extent of about \$2 a ton, probably due to the very large purchase of spelter made recently by the Steel Corporation for its affiliated interests. We quote prime grades of Western at 5.62 $\frac{1}{2}$ c., East St. Louis, equal to 5.75c., Pittsburgh.

Spikes.—No large orders have recently come from the railroads, most of them having placed contracts late last year, covering their requirements up to July, against which they are specifying liberally. The demand for boat spikes and for small railroad spikes is fairly active. We quote standard sizes of railroad spikes, $4\frac{1}{2}$ x 9-16 in. and larger, at \$1.70 for Western shipment and \$1.75 for local trade. Boat spikes are firm at \$1.75, base, and small railroad spikes at \$1.75, base. These prices are for carload and larger lots.

Shafting.—Makers of shafting state that the new demand continues quite heavy and specifications against contracts are coming in freely. The shafting trade is referred to as being in satisfactory condition, both from the standpoint of new demand and also of prices, which are reported as being firmly maintained. Regular discounts on shafting are 55 per cent. off in carloads and 50 per cent. in less than carloads, delivered in base territory.

Rivets.—New orders are reported as heavier than for some time, while consumers are specifying freely against contracts placed some time ago, when prices were slightly lower than they are now. It is stated that regular prices on rivets, printed elsewhere in this issue, are being maintained.

Wire Products.—The favorable weather of the past two weeks has resulted in a more active demand for wire products. New orders for wire nails, barb wire and fence

wire are coming in more freely than for some time. As soon as the country roads become passable it is certain that all kinds of wire products will move more freely. Stocks held by jobbers are fairly heavy, but these have been moving out in the past two weeks at a much faster rate. We quote wire nails at \$1.85 in carload and larger lots; painted barb wire, \$1.85; galvanized, \$2.15; annealed fence wire, \$1.65; galvanized, \$1.95, and cut nails, \$1.85, all f.o.b. cars, Pittsburgh, usual terms, with full freight to destination added.

Merchant Pipe.—A hitch has come in negotiations between the Arkansas Natural Gas Company and the banking interests over the placing of its bonds, and it is now announced that the inquiry of this company, which involves 160 miles of 16-in. pipe and 60 miles of 12-in. will probably be held up for some little time. The new pipe mills of the Republic Iron & Steel Company at Lansingville, near Youngstown, Ohio, are pretty well completed, and will commence to roll pipe early in April. Specifications against contracts are coming in quite freely, and all the leading mills are pretty well filled up with orders for the next 60 days or longer. It is stated that discounts printed elsewhere in this issue are being firmly held. A meeting of the National Association Pipe Jobbers will be held in Pittsburgh on March 14, 15 and 16, and will be attended by leading jobbers from all over the country. An attractive programme of entertainment has been prepared and the meeting is expected to be one of the most interesting ever held by this important organization.

Boiler Tubes.—The railroads and locomotive builders are placing orders more freely for tubes than for some time, and consumers of merchant tubes are also buying more liberally. Mills report that their product is moving out freely and that specifications against contracts are being received at a very satisfactory rate. We are advised that the regular discounts printed elsewhere in this issue are being firmly held.

Coke.—The movement to establish a central selling agency to handle the output of a number of the leading independent coke operators is making fair progress, but will probably require some little time to consummate. The idea of the coke operators seems to be to put the price of standard makes of furnace coke at one-seventh the price of Bessemer pig iron, prices of coke to rise and fall with the market on that iron. The output of coke in the Upper and Lower Connellsville regions last week was 461,774 net tons, a decrease over the previous week of 1349 tons. We quote standard makes of furnace coke running less than 1 per cent. in sulphur at \$2.50 to \$2.60 per net ton at oven, while other makes of furnace coke running higher than 1 per cent. are offered at somewhat lower prices. The best makes of 72-hour foundry coke are quoted at \$2.60 up to \$3.15 per net ton, at oven, while other makes not so favorably known can be had as low as \$2.25.

Iron and Steel Scrap.—Sentimentally, at least, the scrap trade is showing some betterment, but when it comes to actual sales by dealers to consumers the improvement in the situation is not so noticeable. Most consumers of scrap are fairly well covered for the time being and are not actively interested in new purchases unless material is offered to them at attractive prices. We note a fairly active inquiry for heavy steel scrap, steel car axles and low phosphorus melting stock, these grades of scrap moving more freely than others. Prices are fairly strong, but in some cases, where scrap is loaded on cars and has to be moved, lower figures are made than are given in our table of prices. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Fol-	
lansbee, Sharon, Monessen and Pitts-	
burg	\$16.50 to \$16.75
No. 1 foundry cast	16.50
No. 2 foundry cast	15.75 to 16.00
Bundled sheet scrap, at point of ship-	
ment	14.00 to 14.25
Rerolling rails, Newark and Cambridge,	
Ohio, and Cumberland, Md.	17.75 to 18.00
No. 1 railroad malleable scrap	15.75 to 16.00
Grate bars	12.50 to 12.75
Low phosphorus melting stock	21.00
Iron car axles	26.50 to 27.00
Steel car axles	22.00 to 22.25
Locomotive axles	27.50 to 28.00
No. 1 busheling scrap	15.00 to 15.25
No. 2 busheling scrap	11.00
Old car wheels	16.75 to 17.00
Sheet bar crop ends	17.50 to 18.00
Cast iron borings	9.50 to 10.00
Machine shop turnings	11.75 to 12.00

The Carbon Steel Company, Pittsburgh, Pa., which heretofore has maintained offices only at its works at Thirty-second and Smallman streets, in that city, finds that its business in the Pittsburgh district has increased to such an extent that downtown sales offices have become necessary, and it has therefore opened offices in rooms 1028-1030 Park Building, in charge of E. V. Porter as sales manager.

Harry O. Price, formerly identified with the Pittsburgh office of Walter-Wallingford & Co., has become a partner in C. H. Lewis & Co., brokers in pig iron and coke, Cleveland and Pittsburgh. He will have charge of the Pittsburgh territory, in an office temporarily located in the Park Build-

ing, which will later be moved to the Oliver Building. Frank Lewis, who heretofore has had charge of the Pittsburgh office, will go to the Cleveland office. Mr. Price will be assisted at Pittsburgh by Andrew J. MacEwan.

Chicago.

FISHER BUILDING, March 9, 1910.—(By Telegraph.)

Railroad buying has become a very important feature of the market. The jobbing houses which carry large stocks of iron and steel and miscellaneous materials have had an unusual rush of business the past week from the railroads, especially in storekeepers' supplies. The railroads are now paying store prices for all the material they can lay hands upon for spot delivery, when they might as well have bought at mill prices if they, like commercial buyers, had anticipated their necessities by contracting with the mills a few months in advance. The demand has been so great that in many cases the jobbers have had to prorate their available stocks. This anxiety on the part of the railroads and their storekeepers is in striking contrast with their policy a month ago when their attitude toward the market had so depressing an influence. Orders for steel cars are reaching the definite form of inquiries from the car builders regarding deliveries of the steel which will be required. Recent inquiries of this character which have not reached the contract stage cover more than 100,000 tons of steel for car building, with a much larger tonnage in prospect. Railroad orders for bridge material are coming forward steadily and there are inquiries in the market from Western lines for a considerable tonnage. On both railroad and building construction the independent fabricators have been making concessions recently, but confined to a narrow margin which does not indicate any weakness in mill prices. There is a fair current demand for sheets and plates and the distribution of wire products is very active. Nothing has developed as yet regarding prices of bars for delivery beyond July 1. The mills are sold up until July, and are very reluctant to take any business for delivery beyond that date until they can clean up the specifications now on their books. Industrial buyers continue to pay stiff premiums for bars for prompt shipment and are taking all they can get from store. This applies also to machinery and merchant steel on which the mills are four to eight months behind. The consumptive demand for copper and other metals has been unusually good the past week, following the dull market in February. The scrap market is generally weak and buyers indifferent, excepting in a few lines like car axles and rolling rails.

Pig Iron.—The iron men are still waiting for the long expected buying movement, but the feeling is much better this week and the consensus of opinion is that an active market is nearer in prospect. Actual sales and inquiries are scattering and are generally for small amounts. The resale or certificate iron which was offered so freely last week at \$13 has apparently been closed out, and this is regarded as the most favorable feature of the situation. Last week nearly all of the houses selling Southern iron had some of it which they were anxious to sell, but this week only one house reports having any of it left, and only a small amount. There is more willingness among the furnace interests to accept \$13.50 as the price for the first half and \$14 for the last half on Southern iron, but there is apparently nothing done below these figures except on high phosphorus Tennessee grades, which are hard to move in a narrow, restricted market. The largest transaction reported for the week in Southern iron was a lot of 1500 tons for second quarter sold to a local manufacturing interest which had inquired for 4500 tons for second, third and fourth quarter. Other sales reported for the week were small and scattering. The situation is quiet in Northern iron, as the local furnace interests have but little unsold for the first half and are not active in seeking business for the last half. The current price, \$18.50, for No. 1 Northern, can be done for the last half, but buyers have not shown much inclination to cover their requirements, although they are more interested in discussing market conditions with the iron men than they were a few weeks ago. The market for charcoal iron is quiet since the sale of about 5000 tons to the malleable foundries some time ago. The price of charcoal grades has not been affected by the reduction of 50 cents in Northern iron which was reported last week. No transactions are reported in high silicon or silvery iron. A fair tonnage of Ohio basic has been sold for delivery at East St. Louis, and there are tentative inquiries for Northern foundry iron. The following quotations are for March shipment, Chicago delivery:

Lake Superior charcoal	\$19.50 to \$20.00
Northern coke foundry, No. 1	19.00 to 19.50
Northern coke foundry, No. 2	18.50 to 19.00
Northern coke foundry, No. 3	18.00 to 18.50
Northern Scotch, No. 1	19.50 to 20.00
Southern coke, No. 1	18.35 to 18.85
Southern coke, No. 2	17.85 to 18.35
Southern coke, No. 3	17.35 to 17.85
Southern coke, No. 4	16.85 to 17.35
Southern coke, No. 1 soft	16.85 to 18.85

Southern coke, No. 2 soft.....	17.85 to 18.35
Southern gray forge.....	16.60 to 17.10
Southern mottled.....	16.35 to 16.85
Malleable Bessemer.....	18.50 to 19.00
Standard Bessemer.....	20.40 to 20.90
Jackson Co. and Kentucky silvery, 6%.....	21.40 to 21.90
Jackson Co. and Kentucky silvery, 8%.....	22.40 to 22.90
Jackson Co. and Kentucky silvery, 10%.....	23.40 to 23.90

(By Mail.)

Billets.—Consumers in this district are obtaining their supplies from Pittsburgh or Eastern mills at prices governed by conditions in those markets.

Rails and Track Supplies.—Orders for standard rails taken by Chicago mills last week amounted to 22,000 tons, principally Bessemer, and some business offered could not be taken because the local mills could not make as early delivery as the purchaser desired. The railroads continue to specify liberally for track supplies.

Structural Material.—New business continues to come forward more freely, both in building construction and railroad work. As a result of the slackening of orders in January and February, some of the fabricating interests are disposed to make fractional concessions in prices. It is believed that this does not go far enough to indicate any weakness in the mill prices of the material, as the concessions made on the business taken recently have been within so narrow a margin that they would be accounted for by figuring a little closer on the cost of fabricating. The leading interest has not followed the policy of the independent fabricators in this respect, apparently in the belief that there will be sufficient business to exhaust the capacity of all the fabricating shops during the year. The railroads will require a large amount of material for bridges and elevation work and some very attractive building projects are coming forward. The Great Northern Railway has placed with the Wisconsin Bridge & Iron Company an order for miscellaneous bridges amounting to 2100 tons. The Chicago, Milwaukee & St. Paul has ordered 460 tons of plate girder bridges from the Worden-Allen Company, and has also given a 165-ton bridge contract to the Wisconsin Bridge Company. The San Antonio & Aransas Pass Railroad has ordered 500 tons of bridges from the Virginia Bridge Company. The Soo Line has given the Chicago Bridge & Iron Company the contract for a bascule bridge, 87 tons. The Putnam Building at Davenport, which calls for 1050 tons, has been let to Vierling, McDowell & Co., Chicago. The Continental Bridge Company of Peotone, Ill., has taken a 300-ton contract for buildings for the United States Gypsum Company at Fort Dodge, Iowa. The Minneapolis Steel & Machinery Company will furnish 400 tons for a plant of the Denver Portland Cement Company. The Progress Building in Chicago, 250 tons, was let to A. Bolter & Sons. The St. Joseph Hospital at Denver, 80 tons, was let to F. O. Brown of that city. The contract for a 350-ton penstock for the Capital City Improvement Company, Helena, Mont., went to the Minneapolis Steel & Machinery Company. The Denver City Tramways Company's building at Denver, Colo., which would have taken 1800 tons of structural steel, has been changed to reinforced concrete. We quote plain material from mill, 1.78c. to 1.88c., Chicago; from store, 2c., Chicago.

Plates.—There is a good volume of new business in both sheared and universal plates. New car business is beginning to assume definite form, as inquiries from the car builders regarding deliveries are now in the market for 100,000 to 150,000 tons of steel plates and shapes. In view of the fact that most of the railroads are turning to steel cars or steel underframes to replace wooden equipment, the year 1910 will undoubtedly prove a record breaker in this branch of the steel industry and the structural material going into cars will prove an important factor in filling up the structural mills, which are still behind on their deliveries to car builders and fabricating plants. We quote mill prices at 1.78c. to 1.88c., Chicago; store prices, 2c., Chicago.

Sheets.—There is a fair volume of new business in sheets and the situation remains practically unchanged in the matter of prices as well as delivery. Blue annealed sheets continue scarce for any near delivery. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 2.90c. to 3c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—Industrial buyers are still paying heavy premiums for soft steel bars for spot or prompt shipment and there are large sales from store to manufacturing consumers who usually get their supplies directly from the mills. Hard steel bars for concrete work are also in good demand. Contractors began in February to buy this material for their summer work and have been getting it on the ground all winter, so they would be sure to have it when they need it. The early demand came principally from the Southwest, but shipments are now going out freely to Northern territory, and it is evident there will be a considerable increase this summer in bars for reinforcing concrete. The bar iron market continues comparatively quiet, but there is a little more new business. The leading railroad buyers in this market made contracts last fall covering their requirement to July 1, on which they are specifying freely. One West-

ern road not covered by a contract recently bought 500 tons and there have been other sales, which made a fair volume of business for the week. Nothing has been done thus far regarding prices for the agricultural implement trade for next year. The soft steel bar mills will be busy until July with the business now on their books, and do not quote any prices beyond July excepting in special cases. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.68c. to 1.78c.; bar iron, 1.55c. to 1.60c.; hard steel bars rolled from old rails, 1.60c. to 1.65c., all Chicago.

Rods and Wire.—The wire mills continue 8 to 10 weeks behind in their deliveries on specifications from industrial buyers, but it is expected they will make gradual progress from now on in overtaking the demand, as the railroads will be able to give better service on inter-mill shipments, which have caused much of the delay this winter. There is apparently no foundation, in the West at least, for the reports that prices of wire products are being shaded. Many industrial buyers would be glad to pay premiums if that would facilitate deliveries or obtain any preference, and it is expected that the distribution of wire products through the jobbing trade will be very active during the next 60 days. We quote Bessemer, open hearth and chain rods at \$36, Chicago. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.83c.; wire nails, 2.03c.; painted barb wire, 2.03c.; galvanized, 2.33c., all Chicago.

Merchant Steel.—The disappointment in the agricultural implement trade over the inability of the mills to furnish all the special steel that could be used this year, still finds expression in efforts to book orders for spring shipment. An early buying movement is expected for the coming year. There is a rush of purchases from store in all lines of merchant steel, owing to the fact that the mills are so far behind in deliveries.

Cast Iron Pipe.—The Chicago water pipe contract which has been pending for several weeks has been let to the United States Cast Iron Pipe & Foundry Company, the quantity to be taken under this contract being estimated at 5800 tons. The same interest obtained 3400 tons in the Cleveland letting last week and 500 tons at Toledo. The railroads have been liberal buyers of culvert pipe recently, this business for the past week having reached a considerable tonnage. Routine orders are also very satisfactory. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$28.50; 6 to 12 in., \$27.50; 16-in. and up, \$26.50, with \$1 extra for gas pipe.

Metals.—The consumptive demand for the metals has been very irregular the past winter, active and dull periods succeeding each other in a most erratic manner without affecting prices, which have been controlled by speculative interests. For the past week the consumptive demand has been very active, with no change in prices excepting in spelter, which is quoted a fraction higher. Tin holds at about the same level of value in the face of the largest stocks in many years. We quote Chicago prices as follows: Casting copper, 13½c.; lake, 14c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, car lots, 3½c.; small lots, 35c.; lead, desilverized, 4.60c. to 4.70c., for 50-ton lots; corrodin, 4.85c. to 4.95c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.70c. to 5.80c.; Cookson's antimony, 10½c., and other grades, 9½c. to 10½c.; sheet zinc is \$7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote: Copper wire crucible shapes, 13½c.; copper bottoms, 12c.; copper clips, 13½c.; red brass, 12½c.; yellow brass, 10c.; light brass, 7c.; lead pipe, 4½c.; zinc, 5.25c.; pewter, No. 1, 23c.; tin foil, 26c.; block tin pipe, 28c.

Old Material.—The market is quiet but irregular this week, some lines being higher while others are lower. Re-rolling rails are a shade stronger and in good demand, and old car axles are eagerly sought by buyers, steel axles being very scarce. On the other hand, melting steel scrap is easy and very hard to place with buyers. A large interest which took the overflow from the Chicago market all winter has not been accepting deliveries of steel scrap for several weeks and the price dropped during that time about \$1 a ton. Busheling scrap is also slow as well as pipe and flues. There are two railroad lists in the market to close this week amounting to a fair tonnage, and it is expected that there will be larger offerings from railroads during the next month or two, as well as from the country. The market for wrought scrap is very quiet and reflects the condition of the bar iron trade. The mills are likely to be indifferent buyers of scrap until they have more business on their books for their product, as their policy is to buy whenever necessary to cover contracts for bars.

Old iron rails.....	\$19.00 to \$19.50
Old steel rails, rerolling.....	17.75 to 18.25
Old steel rails, less than 3 ft.....	16.50 to 17.00
Relaying rails, standard sections, subject to inspection.....	24.00 to 25.00
Old car wheels.....	17.00 to 17.50
Heavy melting steel scrap.....	15.00 to 15.50
Frogs, switches and guards, cut apart.....	15.00 to 15.50
Shoveling steel.....	14.50 to 15.00

The following quotations are per net ton:

Iron angles and splice bars.....	\$17.00 to \$17.50
Iron car axles.....	21.50 to 22.00
Steel car axles.....	23.00 to 24.00
No. 1 railroad wrought.....	14.25 to 14.75
No. 2 railroad wrought.....	13.25 to 13.75
Springs, knuckles and couplers.....	14.00 to 14.50
Locomotive tires, smooth.....	18.50 to 19.00
No. 1 dealers' forge.....	12.00 to 12.50
Steel axle turnings.....	11.00 to 11.50
Machine shop turnings.....	9.75 to 10.25
Cast and mixed borings.....	6.50 to 7.00
No. 1 busheling.....	12.00 to 12.50
No. 2 busheling.....	9.50 to 10.00
No. 1 boilers, cut to sheets and rings.....	11.00 to 11.50
No. 1 cast scrap.....	14.50 to 15.00
Stove plate and light cast scrap.....	12.50 to 13.00
Railroad malleable.....	14.50 to 15.00
Agricultural malleable.....	13.00 to 13.50
Pipes and flues.....	11.00 to 11.50

W. M. Barth, formerly manager of the Chicago office of the Cal. Hirsch & Sons Iron & Rail Company, has engaged in the scrap iron business in Peoria, Ill., with an office in the Woolner Building and a yard in East Peoria.

Philadelphia.

PHILADELPHIA, PA., March 8, 1910.

The local market has been somewhat upset by labor troubles. The strike of the car men of the Philadelphia Rapid Transit Company, begun over two weeks ago, culminated on Saturday last in a sympathetic strike on the part of many union men in other lines. The building and textile trades have been the most affected, while a sprinkling of molders, machinists and metal trades constructors also walked out. The larger iron and steel working plants have not been affected, but it will probably be several days before the extent of the sympathetic strike can be accurately measured. The situation has hindered local business to a considerable extent, although the general undertone of the market is better. Prices of crude and finished materials appear to be firmer, and it is believed that the downward movement has been checked. In some grades of pig iron buying has been a trifle better. A more active demand for plates and shapes is noted. Billets are also being freely taken, but bars continue dull. Transactions in old material have been light, but the market has a little better tone.

Pig Iron.—A moderate volume of business has been transacted in the foundry grades. The cast iron pipe foundries continue the most active buyers, taking fairly good tonnages of off iron. A number of furnaces are still working unsatisfactorily, and the disposition of makers seems to be to move off grades as rapidly as they are produced and to permit of no accumulation of such stocks on the furnace banks. In many cases deliveries on orders for iron of the higher grades have not been made as promptly as customers desire. Standard brands of Northern No. 2 X foundry are not being freely taken, except in small lots for near future shipment, for which prices range around \$18.25 to \$18.50, delivered in this vicinity, although \$18 can be done on some brands, dependent on the customer, tonnage and delivery. There has been a little more inquiry for moderate quantities for second quarter shipment, but purchasers are hardly prepared to buy, although they are keeping in pretty close touch with the market. The heaviest buying during the week has been done by the cast iron pipe makers, who have taken from 4000 to 5000 tons in the aggregate, mostly off grades. Several pipe plants are still in the market for moderate quantities of high grade foundry iron, while one Delaware River concern now has inquiries out for about 18,000 tons, mostly low grade, for second quarter delivery. A local consumer has taken about 1500 tons of coke malleable for second quarter delivery at what is considered a low price, and is still in the market for a further block. A better movement in Virginia foundry irons is noted. A seller who has recently been naming the inside price for No. 2 X foundry has sold quite extensively of late and has moved the price for that grade up to \$18.50, delivered; \$18.25, however, can still be done for delivery in this territory during the first half, with No. 2 plain at \$18, delivered, the general tendency of the Virginia producers being to name a variation of but 25c. a ton between the two grades. Sales during the week have ranged from carloads to lots of 800 tons, for the delivery above named, aggregating, however, several thousand tons. Sellers of Virginia iron report an increasing inquiry, particularly from New England, for iron for third quarter delivery, but, for the most part, refrain from making quotations that far ahead. While some little Southern iron has been taken by the cast iron pipe makers, practically no sales have been made to the general foundry trade. Resale iron is still to be had for prompt shipment at \$13, Birmingham, for No. 2, with \$13.50 named for delivery over the remainder of the first half. Several small lots of Southern forge iron have been sold at \$12.50, Birmingham. Northern forge continues rather inactive and the market, in the absence of business, is quoted nominally at \$17 to \$17.50, delivered in this vicinity. There has been no movement in the steel making grades. Basic consumers

complain of unsatisfactory deliveries on existing contracts, but have not been seriously inconvenienced by those conditions. With the prevailing better weather conditions, furnaces should be able to work closer to grade, which would help the situation considerably. Melters do not show any indications of entering the market for extended requirements, and prices for basic are nominally unchanged at \$18.50, delivered. Prompt iron from outside the district has been offered, it is said, at a concession, but no sales are reported. There is a moderate demand for standard low phosphorus iron, but sales have been light. Makers of this grade still experience difficulties in obtaining satisfactory ore supplies. Prices generally show no change, although the tone is, if anything, a trifle stronger. Buyers as a rule are keeping in pretty close touch with the market, and will no doubt purchase quite liberally as soon as they feel that the bottom has been reached. For deliveries in buyers' yards, eastern Pennsylvania and nearby points, during the remainder of the first half, the following range of quotations is named for standard brands:

Eastern Pennsylvania, No. 2 X foundry.....	\$18.00 to \$18.50
Eastern Pennsylvania, No. 2 plain.....	17.50 to 18.00
Virginia, No. 2 X foundry.....	18.25 to 18.50
Virginia, No. 2 plain.....	18.00 to 18.25
Gray forge.....	17.00 to 17.50
Basic.....	18.50
Standard low phosphorus.....	23.00 to 24.00

Ferromanganese.—The market is practically at a standstill, no inquiry having developed from consumers in this territory. Quotations are entirely nominal, at \$43 to \$44, Baltimore.

Billets.—An active demand for moderate lots is reported. Specifications are also coming out quite freely and makers' order books are well filled for deliveries up to mid-year, beyond which they still refuse to quote. Prices for ordinary open hearth rolling billets are strong, at \$30.60, delivered in this vicinity. Forging billets are fairly active, with prices ranging from \$32 to \$34, f.o.b. Eastern mill, dependent on analysis, delivery and tonnage.

Plates.—A considerably improved demand has developed. There is a better run of small orders, while specifications continue to come out freely. The placing of orders for seven car floats, four with the New York Shipbuilding Company and three with the Wm. Cramp & Sons Ship & Engine Building Company, will result in orders for some 3000 tons of plates. Bids for steel pipe contracts in the West requiring about 14,000 tons of plates, in which Eastern mills are interested, will be opened in a day or two, and considerable other business of an important nature is pending. Prices for business of an ordinary character show more firmness, 1.75c. to 1.80c. about representing the market for deliveries in this vicinity. On heavy desirable orders, however, it is believed that some makers are still likely to make some concessions.

Structural Material.—While there is a somewhat better demand in sight, the market is not very strong. Frank C. Roberts & Co., engineers, of this city, have made plans and will receive estimates March 10 for a railroad bridge to be built for the Upper Merion & Plymouth Railroad Company across the Schuylkill River, between Swedeland and Ivy Rock, Pa. The proposed bridge is intended principally for the transportation of hot metal from the blast furnace plant of the Richard Heckscher & Sons Company to the steel works of the Alan Wood Iron & Steel Company at Ivy Rock. About 1200 tons of structural material will be required, but it is not known when the contract will be definitely placed, as a number of details have not yet been settled. Some fair business in ship shapes and car material is pending, while several good sized building projects in this and nearby cities, on which bids have been made, are still unclosed. Current business has been largely of a miscellaneous character, but the outlook is considered more favorable. Prices range from 1.70c. to 1.75c. for plain shapes delivered in this vicinity, dependent on specification and delivery.

Sheets.—An active movement continues. Orders for moderate sized lots are coming out freely and mills have about as much business as they can conveniently take care of. Prompt shipments command a premium, while for reasonable delivery the following range of quotation is named: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

Bars.—The demand shows little change, while prices have a tendency toward weakness. Buyers still hesitate and the bulk of the business placed is of an unimportant character. A number of the leading mills still hold prices for refined iron bars around 1.70c., delivered in this vicinity, although quotations ranging from 1.57½c. to 1.67½c. more closely represent the market. Steel bars are quoted at 1.60c. to 1.65c., delivered here, but prompt deliveries are hard to obtain.

Coke.—Market conditions show little variation, consumers evincing little disposition to enter contracts under present conditions, and the bulk of the business is therefore in small lots for prompt and near future shipment. Foundry coke is available at prices ranging from \$2.50 to \$3.25 per net ton at oven, dependent on grade, tonnage and delivery.

Furnace coke, however, does not show the same wide range, \$1.75 to \$2.25, at oven, about representing the market. For delivery in this territory the following range of prices per net ton is quoted:

Connellsville furnace coke.....	\$4.00 to \$4.50
Foundry coke.....	4.75 to 5.50
Mountain furnace coke.....	3.60 to 4.10
Foundry coke.....	4.35 to 5.10

Old Material.—While there has been no important buying, somewhat better feeling prevails. Rolling mills show more disposition to enter the market, although no sales of importance have been made. There has been some light movement of heavy melting steel between dealers, and one outside mill has purchased a small lot. The associated mills have, however, made no further purchases through their representative in this district. Quotations are still largely nominal, the following range about representing the market for deliveries in buyers' yards in this territory:

No. 1 steel scrap and crops.....	\$16.50 to \$17.00
Old steel rails, rerolling.....	17.50 to 18.00
Low phosphorus.....	22.50 to 23.00
Old steel axles.....	23.50 to 23.50
Old iron axles.....	27.50 to 28.00
Old iron rails.....	20.00 to 21.00
Old car wheels.....	16.75 to 17.25
No. 1 railroad wrought.....	18.50 to 19.00
Wrought iron pipe.....	16.00 to 16.50
No. 1 forge fire.....	15.00 to 15.50
No. 2 light iron.....	10.25 to 10.75
Wrought turnings.....	13.00 to 13.50
Cast borings.....	11.50 to 12.00
Machinery cast.....	16.00 to 16.50
Railroad malleable.....	16.00 to 16.50
Grate bars.....	13.50 to 14.00
Stove plate.....	12.50 to 13.00

Cleveland.

CLEVELAND, OHIO, March 8, 1910.

Iron Ore.—Sellers of Lake Superior ores do not expect much further activity in the market until a buying movement in foundry pig iron sets in. A number of large makers of that grade of iron have not yet purchased all their expected requirements of ore and are not expected to make further purchases until they have a satisfactory tonnage on their books for the last half delivery. Eastern buyers are also still holding off. The only sales reported during the week are very small lots. We quote prices as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—The market shows a little more life. A local jobbing foundry is in the market for 1000 tons of No. 2 Scotch for the last half delivery. Another local interest is feeling the market for prices on 2000 tons of foundry iron for the same delivery. The only actual sales reported are a few small lots of 300 tons and under for early delivery and during the second and third quarter. Some consumers in this territory are not yet fully covered for their second quarter requirements, but under the conditions that have existed the past few weeks they have felt that they need be in no hurry to buy. Lower quotations have been made during the week by Valley furnaces than prices that have recently prevailed. The sale of a small tonnage of No. 2 foundry is reported as low as \$15.95, Valley furnace, for early delivery. We quote No. 2 foundry at \$16 to \$16.25, Valley furnace, for spot shipment and second quarter, and \$16.50 for the last half. For spot shipment and the remainder of the first half we quote, delivered, Cleveland, as follows:

Bessemer	\$18.90
Northern foundry, No. 1.....	\$17.25 to 17.75
Northern foundry, No. 2.....	16.90 to 17.25
Northern foundry, No. 3.....	16.50 to 16.90
Gray forge.....	16.15 to 16.40
Southern foundry, No. 2.....	17.85 to 18.10
Jackson County silvery, 8 per cent. silicon.....	21.55

Coke.—While prices appear no better, the market has taken on a slightly firmer tone. The demand continues light. Standard Connellsville furnace coke is held at \$2 to \$2.30 per net ton at oven for spot shipment and \$2.20 to \$2.30 for the first half. We quote 72-hour Connellsville foundry coke at \$2.75 to \$3 for spot shipment and \$3 on contract.

Finished Iron and Steel.—The general feeling regarding future conditions continued to show an improvement, and this feeling is reflected in the increased volume of specifications reported by a number of mill agencies during the week. Only a moderate volume of new business is coming out and this is mostly for early delivery for work underway. Owing to the slow deliveries on steel bars, however, some consumers are anticipating their third quarter requirements and placing orders for that delivery. Others are showing some hesitation about placing contracts for future needs. On steel bar contracts consumers have as a rule kept their specifications up to the pro rata monthly installments provided in their contracts. Prices are firm at 1.45c. to 1.50c., Pittsburgh. One leading independent interest that has been taking on some tonnage at the former price has advanced its minimum price to 1.50c. The demand for plates in small lots for early delivery shows some improvement and mills able to make reasonably prompt shipment report a fair

volume of orders. The ruling price is 1.55c., Pittsburgh, although some mills are holding to 1.60c. The demand for structural material has been light for some time, this being largely attributed to weather conditions. With the approach of spring, however, specifications on shapes from fabricators show considerable improvement. New structural work has been slow in coming out because the severe winter has prevented outside construction work, but local architects and fabricators report that they are figuring out a good volume of small work, and it is believed that some of the structural mills that can now make fairly prompt deliveries will soon be filled up. The demand for sheets continues fairly good and prices are firm. In a few cases buyers have made contracts for the third and fourth quarter at slightly above current prices. The smaller sheet mills report a good volume of orders, but many of them can make fairly prompt deliveries. The demand for iron bars is holding up well and local mills have more specifications on their books than for several weeks. We quote iron bars at 1.55c. to 1.60c., Cleveland. The demand for shafting continues good. There is a fair demand for forging billets, \$32, Eastern mill, being the usual quotation for early delivery. The contract for 3400 tons of cast iron pipe for the water works department of the city of Cleveland has been awarded to the United States Cast Iron Pipe & Foundry Company on a bid of \$85,000. Jobbers report a good demand for nearly all finished lines out of warehouse stocks.

Old Material.—The market shows a slight improvement in that there is some buying in small lots, as compared with the few previous weeks, during which there was practically no demand. A limited number of small orders are now coming from both the mills and foundries. Mills as yet, however, are placing no new contracts. Dealers are buying freely whatever scrap they can pick up at low prices. Quotations remain stationary, but in the absence of transactions are largely nominal. The Big Four and the Baltimore & Ohio railroads have lists out this week. The Lake Shore Railroad has not had a list out since late in the fall because of the heavy demand for its cars in the coal trade. Prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$16.00 to \$16.50
Old iron rails.....	18.00 to 18.50
Steel car axles.....	20.00 to 20.50
Heavy melting steel.....	15.00 to 15.50
Old car wheels.....	16.50 to 17.00
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	14.00 to 14.50
Railroad malleable.....	16.00 to 16.50
Light bundled sheet scrap.....	10.50 to 11.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.00 to \$21.50
Cast borings.....	8.25 to 8.50
Iron and steel turnings and drillings.....	9.00 to 9.50
Steel axle turnings.....	11.00 to 11.50
No. 1 busheling.....	13.00 to 13.50
No. 1 railroad wrought.....	15.00 to 15.50
No. 1 cast.....	14.25 to 14.75
Stove plate.....	12.00 to 12.50
Bundled tin scrap.....	11.00 to 11.50

The Domhoff & Joyce Company, Cincinnati, has opened a branch office in Cleveland. It is located at 1331 Schofield Building, with R. D. Jenkins in charge. In addition to handling its present lines of pig iron and coke, the company has been appointed exclusive sales agent in the Cleveland and Pittsburgh territories of the Sloss-Sheffield Steel & Iron Company.

Birmingham.

BIRMINGHAM, ALA., March 7, 1910.

Pig Iron.—Sales made by both producer and middleman have been of a rather scattering nature. For instance, one of the largest producers reports that its Southern sales office booked something like 350 tons during the week for prompt shipment at \$14, at the furnace. Sales have been made at \$13.50 for early shipment. Under present conditions \$13.50 for prompt and \$14 for shipment over the last half of the year seem to about correctly represent the market, and very few sales are being made at those figures. The absence of inquiries is very much in evidence and buyers, on the whole, seem utterly indifferent as to their future requirements. There is an inexplicable lack of faith somewhere, and the case becomes even more mysterious when one recalls the fact that buyers all over the country are running their plants full time and melting pig at an unprecedented rate. Some suggest that the situation is materially affected by the presence of so large a tonnage of warrant iron, yet a canvass as to actual sales of resale iron reveals the fact that warrant iron is not being turned loose as freely as one might think, brokers being able to secure a sufficient tonnage of iron in other directions to supply customers, thereby holding in reserve iron bought some time ago for the purpose of being stored and held for speculative purposes. As a matter of fact, present prices do not justify the sale of any material tonnage of this iron—from the viewpoint of a speculator. Charcoal iron is quoted at \$22 to \$22.50, at the furnace.

Cast Iron Pipe.—With the advent of more favorable

weather, manufacturers of heavy cast iron pipe confidently look for a decided change in conditions. Thus far it has been more or less of a hand-to-mouth problem. Local foundries are able to run full time and no lettings of special importance are reported. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., \$25; 8 to 12 in., \$24; over 12-in., average \$23, with \$1 a ton extra for gas pipe.

Old Material.—Dealers in scrap report that while there is no decided activity in their line, they are able to dispose of their stocks from time to time. Locally the weather the past week has been ideal for the gathering of old material and dealers have been disposed to take on every available ton. There is confidence displayed in the future market. Following prices are quoted, per gross ton, f.o.b. cars here:

Old iron axles.....	\$19.50 to \$20.00
Old iron rails.....	15.50 to 16.00
Old steel axles.....	18.50 to 19.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	11.50 to 12.00
No. 1 country wrought.....	11.00 to 11.50
No. 2 country wrought.....	11.00 to 11.50
No. 1 machinery.....	12.50 to 13.00
No. 1 steel.....	11.75 to 12.25
Tram car wheels.....	12.00 to 12.50
Standard car wheels.....	14.00 to 14.50
Light cast and stove plate.....	10.00 to 10.50

St. Louis.

ST. LOUIS, March 7, 1910.

The ideal weather of the past week has furnished some of the needed stimulant to general business. It has also witnessed the resumption of building operations and out of door work of all kinds. Bank clearings continue to be in excess of the corresponding week last year. The State Board of Equalization reports an increase in the valuation of taxable property of \$103,281,610 over the total of last year. The Terminal Railway Association, including recent real estate purchases, will expend on the east side upward of \$3,000,000. New railroad lines are being projected in this State and in Oklahoma. The tone of the pig iron market is improved. Coke is dull and weak.

Coke.—The market for coke continues dull and featureless. Leading brokers attribute prevailing conditions to an output in excess of requirements. The easy tone of prices tends to buying in small lots, even if in the market for round lots, but the fact that prices are now 75c. per ton lower than the top figures reached awhile ago seems to warrant looking for a reaction, and any considerable improvement in the demand or curtailment of production would bring this about. The threatened strike in the soft coal territory is being watched with interest by the trade. We quote standard 72-hour foundry at \$2.75 for prompt and \$3 for season shipment, per net ton, f.o.b. oven, Connellsville.

Pig Iron.—There is a more cheerful feeling prevailing in the trade, and while to some extent it is anticipatory, yet there is more inquiry than of late and a few good sized orders have been booked. The largest sale reported is 5000 tons of Northern basic to a local steel foundry. This is in addition to the purchase reported last week, of which 3000 tons of low phosphorus basic was sold by De Camp-Yule Iron, Coal & Coke Company for March, April, May and June shipment. Among the other sales mentioned are 1500 tons of Northern foundry for shipment over the last half, 500 tons of Southern foundry for shipment over the second quarter, and 500 tons of Southern No. 2 foundry for shipment over the second and third quarters. An offer of \$13, Birmingham, for 500 tons was declined by a leading house on account of inability to place it, even with liberty to accept any delivery stipulated by the furnace booking the order. Buyers point to the fact that iron is \$1.50 per ton higher than it was at this time last year, as an argument for a concession in price, while sellers remind them of the improved business conditions and demand for finished products. Predictions of an advance within the next 30 days are being made, and some brokers go so far as to claim that it will come as soon as resale iron is cleaned up. The action of the Tennessee Company respecting second quarter terms is being awaited with interest. At present it is not seeking business for that delivery. We quote Southern No. 2 foundry for shipment prior to July 1 at \$13.50; for shipment over the last half \$14, f.o.b. Birmingham; Southern Ohio, \$17, f.o.b. furnace.

Finished Iron and Steel.—The demand for standard rails is excellent. For light rails coal mines have been good buyers, but fears of a strike in the bituminous sections have checked new business. From lumber interests there continues to be a steady inquiry. There is an urgent call from fabricators for shipment of structural material on orders in hand and the tone of this branch is improving. For iron and steel bars there are pressing calls from both manufacturers and jobbers for shipment on specifications. The situation as to track material is a question of ability to give reasonably prompt delivery.

Lead, Spelter, Etc.—Lead is quiet but firm; offered at

4.45c. Spelter is steady and quoted at 5.62½c., East St. Louis. Zinc ore is higher, the output having been cut down by inclement weather and stocks have been reduced; offered at \$45 per ton, Joplin, base. Tin is off 45c. per 100 lb; antimony unchanged; copper is up 10c. The demand for finished metals for the week presents a good average.

Old Material.—Dealers appear to be more confident of renewed buying on the part of consumers in the near future, though the market is still quite dull. Railroad offerings are not heavy and stocks are moderate. The lists reported for the week are as follows: Missouri Pacific, 900 tons; St. Louis & San Francisco, 900 tons; Vandalia, 50 tons. In case of half a dozen items in the list a reduction in price is made, and the prices given for the balance, while more or less nominal, fairly represent dealers' ideas. Relaying rails are very scarce and prices are strong. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$15.50 to \$16.00
Old steel rails, rerolling.....	15.00 to 15.50
Old steel rails, less than 3 ft.....	13.50 to 14.00
Relaying rails, standard sections, subject to inspection.....	26.00 to 26.50
Old car wheels.....	15.50 to 16.00
Heavy melting steel scrap.....	13.50 to 14.00
Frogs, switches and guards, cut apart.....	13.50 to 14.00

The following quotations are per net ton:

Iron fish plates.....	\$14.00 to \$14.50
Iron car axles.....	20.50 to 21.00
Steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	13.00 to 13.50
Railway springs.....	12.50 to 13.00
Locomotive tires, smooth.....	16.50 to 17.00
No. 1 dealers' forge.....	11.00 to 11.50
Mixed borings.....	7.00 to 7.50
No. 1 busheling.....	12.00 to 12.50
No. 1 boilers, ct to sheets and rings.....	10.50 to 11.00
No. 1 cast scrap.....	13.00 to 13.50
Stove plate and light cast scrap.....	9.50 to 10.00
Railroad malleable.....	12.00 to 12.50
Agricultural malleable.....	9.75 to 10.25
Pipes and flues.....	10.50 to 11.00
Railroad sheet and tank scrap.....	9.00 to 9.50
Railroad grate bars.....	10.50 to 11.00
Machine shop turnings.....	10.50 to 11.00

The National Utilization Company, Norfolk, Va., has closed a deal to establish a large plant at St. Louis. Two large factories and warehouses will be built on the Kirkwood branch of the Missouri Pacific Railroad. One will be 200 ft. long and the other more than 100 ft.

The More-Jones Brass & Metal Company will build a new one-story foundry, costing upward of \$30,000. It will adjoin the present works of the company and will give employment to an additional staff of 100 men. The value of the annual output of the company is now upward of \$1,250,000.

The Terminal Railway Association will construct terminals at East St. Louis, on a tract of land recently acquired, capable of accommodating 20,000 cars. A retaining wall will be built from the Merchants Bridge to the Eads Bridge. In addition to expense for land and filling, \$1,000,000 will be expended for constructing tracks.

Cincinnati.

CINCINNATI, OHIO, March 9, 1910.

The good promise suggested in March's opening is being fulfilled. There is a better feeling in all lines save scrap, which is still very weak. Miscellaneous manufacturing interests are reviving, and news from the railroads that indicate confidence in the future has spread to other interests and slumbering projects are coming out. In pig iron there is a feeling of disquietude and uncertainty brought about by a slight increase of interest manifested by the consumer, which is met by the commission men and furnace representatives with offers that must be confirmed, and negotiations are not infrequently productive of false impressions of actual market conditions. Coke is a little stronger and some good sized tonnages for furnace use are in negotiation.

Pig Iron.—There is a little more life in the market, and the interest of the consumer awakened a few days ago by opportunities for some spot bargains in warrant and certificate iron has taken on some of the indications of early purchase for second half requirements. Although it is denied by all representatives of Alabama furnaces in this market that a price of \$13, Birmingham, for No. 2 foundry is quotable for any delivery, it is rather certain that that price may be done for standard Southern iron for March delivery on an attractive tonnage. It is also possible to secure some of the resale iron mentioned at that price. One of the largest agencies in this market turned down to-day an offer of \$13, Birmingham, for 1500 tons for comparatively early delivery. Another sold 900 tons of Southern foundry March 7 and 8 at \$14, Birmingham, all for future delivery. An Ohio malleable manufacturing concern is to-day closing on 500 to 1000 tons for last half. The largest pipe interest is buying low grade foundry for its Anniston plant. A large agricultural manufacturing interest is seeking some Northern and Southern for delivery over the remainder of the

year beginning in September, and it is said is specifying \$16, Ironton, and \$13, Birmingham, as its maximum price. An inquiry from Detroit calls for 500 tons of 4 to 5 per cent. silicon for the last half. A considerable tonnage of basic is reported to have been sold to the St. Louis steel makers who have been in the market for some time and at the delivered price of \$18.50. This iron is said to be an Ohio product. The Jackson County producers are here to-day appearing before the Interstate Commerce Commission in regard to railroad rates on coke shipments. It is difficult to gauge the silvery market in the absence of transactions and the reported aggressiveness of one or more of the producers in that field. The nominal price for March delivery is \$20 for 8 per cent. Jackson County furnace. A large car wheel manufacturing establishment in Chicago territory is said to have bought a large tonnage of Southern iron at an attractive price. There have doubtless been some concessions made on southern Ohio foundry irons in the past few days. For the remainder of the first half \$16.50 can undoubtedly be done, although quotations are firm at \$17, at furnace, for the last half. A large part of the confusing warrant iron has disappeared, and it is expected that all of it will disappear ere April 1. A feature of the trade in this market to-day is the exchange of telegraph, telephone and written communications between agents and furnace interests regarding prices, and the greater part of these are in the form of definite instructions as to maintenance of the quoted range of \$13.50 to \$14 on Southern and \$17 on Northern for the last half. A large steam pump manufacturing interest has bought some additional iron. For prompt delivery and remainder of the first half, based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$17.00 to \$17.50
Southern coke, No. 2 foundry.....	16.50 to 17.00
Southern coke, No. 3 foundry.....	16.00 to 16.50
Southern coke, No. 4 foundry.....	16.00
Southern coke, No. 1 soft.....	17.75
Southern coke, No. 2 soft.....	17.25
Southern gray forge.....	15.75
Ohio silvery, 8 per cent. silicon.....	20.20
Lake Superior coke, No. 1.....	18.20 to 18.70
Lake Superior coke, No. 2.....	17.70 to 18.20
Lake Superior coke, No. 3.....	17.20 to 17.70
Standard Southern car wheel.....	24.75 to 25.25
Lake Superior car wheel.....	21.75 to 22.25

(By Mail.)

Coke.—Some furnace interests are feeling the market for last half requirements, and those using the Wise County product are watching the trend of pig iron prices, which regulate the sliding scale system of buying, for the most part, in that field. The buying is desultory and it is difficult to establish a firm quotation, but Connellsville and Wise County foundry grades may be secured at \$2.65 to \$3, per net ton, at oven, according to delivery. New River and Pocahontas are obtainable at \$2.75 to \$3, either prompt or extended deliveries. Connellsville furnace brands are selling at \$2 to \$2.25 for prompt and \$2.30 to \$2.40 for extended delivery. Wise County furnace coke is obtainable at \$2 to \$2.25 for quick delivery and Pocahontas at \$2.25 to \$2.50. On contract Pocahontas furnace grades are selling at \$2.50 to \$2.75.

Finished Iron and Steel.—Selling agencies report business quite satisfactory in all lines save iron bars, which are weak. Warehousing in all other branches of the finished trade is excellent, and prices are well maintained. Although there are obtainable no open quotations for third quarter and last half business, it is conceded that the existing quotations can be done. Jobbers note a scarcity of stocks in salable sizes of steel bars, and deliveries from the mills do not seem to improve, being still four to five months behind. Structural material is in fair demand; mill prices are 1.00c., Pittsburgh, 2c. out of stock; the impression is that the mill price can be shaded on orders of any size. Iron bars are quiet at 1.50c., Cincinnati, and out of stock 1.75c. to 1.80c. Makers of sheets report that specifications against contracts are good, and note some inquiry for third quarter prices, which, it is thought, will hardly be available before June 1. Quotations for nearby delivery are made on the established Pittsburgh base and premiums for very prompt delivery are \$3 to \$4 a ton or more, as the occasion and necessities warrant. No. 28 galvanized is quoted at 3.50c., Pittsburgh, or 3.65c., Cincinnati; No. 28 black, 2.40c. and 2.55c., respectively, and corrugated roofing sheets at \$1.70 per square for painted, and \$3 for galvanized 2½-in. corrugations. On the general run of iron bar orders 1.50c. to 1.65c. can be done, and out of stock the price is 1.75c. to 1.80c. The McClintic-Marshall Construction Company secured the contract for the material, about 600 tons, which will be needed in the new Oakley plant of the Cincinnati-Bickford Tool Company. The King Bridge Company is understood to have secured about 500 tons of the new bridge work to be constructed in this territory by the Big Four Railroad and engineers have in prospect for closing within the coming week some very good sized deals.

Old Material.—Mills are evidencing little or no interest in melting steel or anything else, but the larger dealers are

taking in some material from the railroads, principally shearing stock. The greater part of such business as is going is between dealers covering short sales. No item is active and our quotations are merely nominal, though as nearly representative of the existing conditions as it is possible to get them in the absence of sales. We quote f.o.b. Cincinnati and buyers' yards in southern Ohio as follows:

No. 1 railroad wrought, net ton.....	\$13.50 to \$14.00
Cast borings, net ton.....	7.50 to 8.00
Heavy melting steel scrap, gross ton.....	14.00 to 14.50
Steel turnings, net ton.....	9.00 to 9.50
No. 1 cast scrap, net ton.....	12.50 to 13.00
Burnt scrap, net ton.....	9.00 to 10.00
Old iron axles, net ton.....	18.00 to 18.50
Old iron rails, gross ton.....	17.50 to 18.00
Old steel rails, short, gross ton.....	15.00 to 15.50
Old steel rails, long, gross ton.....	16.00 to 16.50
Relying rails, 56 lb. and up, gross ton.....	23.00 to 24.00
Old car wheels, gross ton.....	14.50 to 15.00
Low phosphorus scrap, gross ton.....	17.00 to 17.50

Contracts will be let this week for a new lining, three new batteries of boilers and other important features of the rehabilitated furnace of the Lawrence Iron Company, Ironton, Ohio. Extensive new bins for stock will be installed immediately and an additional hot blast stove is to be erected. The plant is to be modernized to permit of a greatly increased output. Matthew Addy & Co., who have been appointed sole agents, announce that they hope to be shipping the product, a high grade, low phosphorus basic, by July. It will be marketed under the trade name of Lawrence basic.

The German Iron Market.

BERLIN, February 24, 1910.—The quieter tendency of the iron market referred to in this correspondence last week finds a striking illustration in the fact that not a single price advance has occurred since then, although numbers of advances had been recorded for every previous week since the beginning of the year. The reports agree in representing the position of the market as generally satisfactory, but some of them note a certain irregularity in various departments of the trade. According to a market summary of the leading newspaper of Essen, portions of the plant there have an abundance of work to keep them busy, while others have not enough to do, especially mills running on products whose prices have already been considerably advanced. Among dealers, too, as this newspaper admits, the recent disturbance of the upward course of business in the American market has raised doubts regarding further developments in Germany. Especially has the movement of the American and English pig iron markets emphasized the necessity of preventing further advances in Germany.

The Steel Syndicate is also apparently impressed with the advisability of keeping prices within moderate limits. It held its monthly meeting to-day, but refrained from making the expected advance in structural shapes. It declared contracts open for the new next quarter, but at unchanged prices. A communication given to the press by the management presents as the ground for not advancing prices the low price of cement and the necessity of encouraging builders to use steel instead of concrete construction. The Syndicate's resumé of the market situation is satisfactory. It says that as soon as business for the second quarter of the year was declared open, orders began coming in, and now the greater part of the home market's demands has been covered. In steel rails the contracts with all the home railroads have been placed till 1912, but they are for very small amounts; further good orders from the foreign markets have come in, and inquiries for large quantities are in the market. The business in rails for mines retains its brisk aspect, and especially is the export business in excellent shape. There is better business in grooved rails, the inquiries from abroad being unusually large, and they have mostly resulted in contracts at better prices. Specifications for structural steel previously ordered are coming in at a satisfactory pace, and the general situation would justify an advance of prices, but for the considerations already mentioned.

The bar iron people are to meet to-morrow and act upon a motion to mark up prices 4 marks per ton. The heavy plate producers are called together for March 3 to discuss a price advance. It was announced yesterday that the negotiations looking toward the organization of the wire nail trade, to which reference has already been made in this correspondence, have finally broken down without result. The cause assigned is that a new wire mill is about to be established at Soest, in Westphalia, which also aims at making nails on a large scale. This concern demanded such big allotments that the other mills were not able to reach an agreement with it.

Two reports of iron companies have this week attracted much attention. Several days ago the Rombacher Hüttenwerke of Lorraine issued a statement of its business results for the half year ended with December 31, showing net earnings of \$835,000, against only \$309,000 for the like period of 1908. The directors of the Laurahütte of Silesia met here to-day and gave out a report which admits a re-

duction of profits during the second half of 1909, as compared with 1908, but they omitted to give figures. This is the leading Silesian company. Its stock has fallen pretty sharply recently in expectation of a rather poor report, and it lost considerable ground to-day.

The efforts to reorganize the iron mining companies of the Siegerland region have not yet proved successful, and the outlook is now looked upon as rather hopeless. In the Reichstag yesterday the Secretary of the Interior referred to the position of the iron trade in that region as extremely unsatisfactory. The secretary rejected with much emphasis the proposal to put a duty on foreign ores for the protection of the many iron mines of the Siegerland district, and remarked that the chief concern with the great iron companies of the Rhenish-Westphalian district was to be able to obtain ample supplies of foreign ores at reasonable prices.

Buffalo.

BUFFALO, N. Y., March 8, 1910.

Pig Iron.—The market has been quiet for the past week, with light demand in the way of new business, although shipments on contracts have been heavy. There is, however, a feeling of confidence on the part of producers that the market will soon experience a better buying demand. What buying has been reported was mostly by the smaller consumers, and there is a good sized aggregate tonnage still under negotiation or in abeyance from this class of purchasers, holding off to determine whether bottom prices have been reached and to take the benefit of any slack still remaining in the price situation, due to any excess there may have been in production. The following schedule approximately represents the Buffalo market for first half and third quarter deliveries, per gross ton, f.o.b. Buffalo, although in some instances furnaces may have accepted 25c. per ton under these figures for grades of which they had a surplus:

No. 1 X foundry.....	\$17.50 to \$18.00
No. 2 X foundry.....	17.25 to 17.75
No. 2 plain.....	17.00 to 17.25
No. 3 foundry.....	16.75 to 17.00
Gray forge.....	16.50 to 16.75
Malleable.....	17.50 to 18.00
Bessemer.....	19.50 to 19.75
Basic.....	18.00 to 18.50
Charcoal.....	20.50 to 21.00

Finished Iron and Steel.—The week shows continued improvement in new business and large specifications on contracts. The mills are just as far behind on bar material as heretofore, deliveries still being delayed from three to four months, and on some sizes from four to five months, causing an increased demand for warehouse deliveries. The season buyers, such as agricultural implement manufacturers, are coming into the market trying to place business from July, 1910, to July, 1911, but mills in most instances consider this further ahead than they want to contract for at the present time. The Lackawanna Steel Company has received a contract from the Merchants' Despatch Transportation Company for 15,000 tons of shapes and plates for use in car construction at its shops at Despatch, N. Y., near Rochester, deliveries to be made through second and third quarters. The New York Central Railroad Company will receive bids March 18 for a new station at Watertown, N. Y., requiring a considerable tonnage of structural steel. Bids will also soon be received for an eight-story hotel for the Reading Hotel Company, Reading, Pa., requiring about 1400 tons of steel, and for a public school at Erie, Pa., 100 tons. Local architects will receive bids in about 10 days for steel for the 11-story Peoria Hotel, Peoria, Ill., requiring approximately 1000 tons. The Baxter Engineering Company, Buffalo, is receiving bids for a new cereal mill and elevator for the Buffalo Cereal Company, of reinforced concrete, with steel tower and head house, requiring about 150 tons of reinforced bars for the concrete construction and 100 tons of structural shapes for the tower and head house.

Old Material.—Little business is being transacted in any line, there being no revival in demand from the mills. During the past few days a little inquiry has developed for malleable and cast scrap, but only for small tonnages. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$15.50 to \$16.00
Low phosphorus steel.....	19.50 to 20.00
No. 1 railroad wrought.....	16.50 to 17.00
No. 1 railroad wrought and machinery cast scrap.....	15.50 to 16.00
Old steel axles.....	20.00 to 20.75
Old iron axles.....	24.00 to 24.50
Old car wheels.....	16.00 to 16.50
Railroad malleable.....	16.50 to 17.00
Boiler plate.....	13.00 to 13.50
Locomotive grate bars.....	12.00 to 12.50
Pipe.....	12.50 to 13.00
Wrought iron and soft steel turnings.....	10.00 to 10.50
Clean cast borings.....	9.00 to 9.50
No. 1 busheling scrap.....	13.50 to 14.00

Pig iron manufacturers in this city have been notified of a 20c. per ton advance in freight rates on coke from the Connellsville region by all railroad companies and their con-

nnections on joint tariff reaching that district. The increase is being strenuously opposed by the Buffalo consumers.

Rapid progress is being made in the construction of the new blast furnace which the Wickwire Steel Company is erecting at Wickwire on the Niagara River, north of Buffalo, and it is expected that it will be completed and in operation by the middle of July.

New York.

NEW YORK, March 9, 1910.

Pig Iron.—Buying by foundries has been of little moment. Water freights have been low enough to put more Southern iron into New England points, in view of the attractive prices named on odd lots of Virginia and Alabama iron in the past 10 days. The fact that a \$1 rate from Buffalo to tidewater will be available by canal for April shipments is postponing business with furnaces in that section, but there is also evident the general disposition of foundrymen to put off buying for their summer and fall requirements. The large inquiries mentioned last week are still pending, including 6000 for one New Jersey foundry, and 4000 to 5000 tons for another. The sales of odd lots of off-trade irons to pipe works on the Delaware River have reached a considerable total, and much of this iron has brought the equivalent of \$16, delivered, for gray forge, whereas \$17, delivered, for standard gray forge is asked by eastern Pennsylvania furnaces. The foundries in this territory are melting iron at a rate fully up to that of the past two months and some increase is looked for with the coming on of the building season. We quote Northern iron at tidewater as follows, for first quarter: No. 1, \$18.50 to \$18.75; No. 2 X, \$18.25 to \$18.50; No. 2 plain, \$18. Southern iron for early delivery is quoted at \$18.25 to \$18.50 for No. 1 and \$17.75 to \$18 for No. 2.

Steel Rails.—The inquiry of the New Haven road for 1910 rails calls for about 10,000 tons of 100-lb. and about 5000 tons of 80-lb. rails, all to be open hearth. Eastern mills have been in rather closer competition for foreign business of late. Russian mills have been successful in getting a Brazilian order—10,000 tons of 70-lb. rails for the Cor-dora Central.

Finished Iron and Steel.—March has opened well and promises a total business considerably ahead of last month's. All lines are more active, including plates. Quite a fair aggregate in small lots, and mostly universal plates, has been closed lately. A goodly number of small bridge orders has also come from the railroads, including the following taken by the American Bridge Company: 600 tons for the Duluth, Missabe & Northern, 300 tons for the Baltimore & Ohio, 250 tons for the Boston & Maine, and 200 tons for the Western Maryland. Still unplaced is an order for 200 tons for the Baltimore & Ohio. The Chicago Bridge & Iron Company has taken an order for 200 tons from the Chicago, Milwaukee & St. Paul Railroad. The King Bridge Company, Cleveland, Ohio, will furnish 600 tons of bridge material to the Cleveland, Cincinnati, Chicago & St. Louis. The Pennsylvania Steel Company has an order for 400 tons of bridge material for the Boston & Maine. The Atlantic Coast Line is inquiring for 2600 tons of material, which will probably go to the Virginia Bridge & Iron Company. The Philadelphia & Reading is taking bids on 1500 tons for a bridge across the Schuylkill River, and the New York, New Haven & Hartford for a bridge at New Haven of 800 tons. The 2500 tons of bridge material inquired for by the Chicago, Hamilton & Dayton was given 1300 tons to the American Bridge Company and 1200 tons to the Mc-Clintic-Marshall Construction Company. Levering & Garrigues have taken the contract for 400 tons for Public School No. 44, New York City. The Baker Iron Works, Los Angeles, Cal., has the contract for 500 tons for the First National Bank Building at Riverside. Milliken Brothers, Inc., has 600 tons for an apartment house at 116th street and Claremont avenue, New York City. The 500 tons for the Richmond Viaduct of the Virginia Railway & Power Company, went to the Richmond Pattern & Structural Iron Works. The Worden-Allen Company, Milwaukee, has 200 tons for a crusher plant for the Cleveland-Cliffs Iron Company. The Berlin Construction Company has 350 tons for the Phoenix Mutual Life Insurance Building, Hartford, Conn. The Girard Iron Company has let 500 tons for a new building at Girard, Ohio, to the Mc-Clintic-Marshall Construction Company. Vierling & McDowell have the general contract for the Putnam Building at Davenport, Iowa, which will require 1000 tons. The Thompson-Starrett Company, as general contractor for the Rector Hotel, New York City, is taking bids on the 2000 tons of steel which will be required. This order and that for 1800 tons for the Yeon Building, Portland, Ore., will probably go to the American Bridge Company. The New Jersey Zinc Company has put out an additional inquiry for new buildings at Palmerton, N. J., probably requiring about 4000 tons. This, with the steel trestle for this company, which is still pending, makes in the neighborhood of 5000 tons for which this company is now in the market. Bids will be in March 18 on 200

tons of structural material for a station on the New York Central at Watertown, N. Y. The Mills & Gibb Building, New York City, Twenty-second street and Fourth avenue, for which the George A. Fuller Company is the general contractor, will need about 2000 tons of steel, which is still to be awarded. The largest inquiry before the plate trade is that for 9000 to 10,000 tons of water pipe for Portland, Ore., the bids for which were closed on March 8. It is reported that the Erie Railroad is in the market for 20,000 kegs of spikes. There have been some concessions in prices of plates and bar iron. Both plain structural material and plates are now quoted at 1.71c., with a minimum of 1.66c. on very desirable orders. Steel bars are firm at 1.61c. to 1.66c., and bar iron has dropped to 1.65c. to 1.70c., New York.

Cast Iron Pipe.—A better feeling prevails among the pipe founders. More inquiry is coming out and the trade shows considerably more life. While municipal contracts are not numerous as yet, the demand is better from private gas and water companies. The New York City awards last week were made to contractors who will purchase the pipe on their own account. The city of Lynn, Mass., will open bids on 500 tons of small sizes of water pipe March 15. Prices are continued at \$25.50 to \$26 per net ton, tidewater, for carload lots of 6 in.

Old Material.—While the demand for old material generally continues light, a more hopeful spirit prevails, probably due to springlike weather, and dealers are looking forward to a more active movement shortly. Foundries are purchasing cast scrap in moderate quantities, but are doing little in stove plate. At current prices some movement is taking place in cast borings, wrought turnings and wrought pipe. Steel scrap is at a standstill, as the eastern Pennsylvania works continue to be well stocked. The following quotations, which are per gross ton, New York and vicinity, about represent the present market:

Rerolling rails.....	\$14.50 to \$15.00
Old girder and T rails for melting.....	14.00 to 14.50
Heavy melting steel scrap.....	14.00 to 14.50
Relaying rails.....	20.50 to 21.00
Standard hammered iron car axles.....	23.50 to 24.00
Old steel car axles.....	19.00 to 19.50
No. 1 railroad wrought.....	16.00 to 16.50
Wrought iron track scrap.....	14.00 to 14.50
No. 1 yard wrought, long.....	14.00 to 14.50
No. 1 yard wrought, short.....	13.50 to 14.00
Light iron.....	8.00 to 8.50
Cast borings.....	9.00 to 9.50
Wrought turnings.....	10.50 to 11.00
Wrought pipe.....	13.50 to 14.00
Old car wheels.....	14.25 to 14.75
No. 1 heavy cast, broken up.....	14.00 to 14.50
Stove plate.....	11.00 to 11.50
Locomotive grate bars.....	11.00 to 11.50
Malleable cast.....	15.50 to 16.00

The New York office of the Passaic Structural Steel Company, successor to the Passaic Steel Company, Paterson, N. J., has been removed from 170 Broadway to 30 Church street.

Metal Market.

NEW YORK, March 9, 1910.

THE WEEK'S PRICES.

Cents per pound.

Copper.	Electro-	Lead.		Spelter.	
		Tin.	New York.	St. Louis.	New York.
Mar. 3.....	13.75	13.37½	32.90	4.65	4.50
4.....	13.75	13.50	32.75	4.65	4.50
5.....	13.75	13.50	...	4.57½	4.42½
6.....	13.75	13.50	32.60	4.55	4.40
7.....	13.75	13.50	32.60	4.55	4.40
8.....	13.75	13.50	32.60	4.55	4.40
9.....	13.75	13.50	32.45	4.55	4.40
				5.73	5.58

The entire metal market has taken on a more optimistic tone. There have been large sales of copper, but the purchasing in other metals is light. There seems to be a fair outlook for the future, however, and the market has a more healthy appearance.

Copper.—Sales of copper during the last week have been large, and it is conservatively estimated that fully 50,000,000 lb. have changed hands. Prices have not hardened as much as might be expected under the circumstances, but there has been a noticeable advance. The sales made during the recent buying movement will not show in the forthcoming report of the Copper Producers' Association, as most of the copper sold was for delivery in April, May and June. We quote electrolytic at 13.50c. and lake at 13.75c. Some sales of lake have been reported at 13.87½c. Sheet copper has advanced to 19c. This is a general advance and this price is the minimum. The old price of 18c. was occasionally shaded. L. Vogelstein & Co. report the following figures of German consumption of foreign copper for the month of January, 1910: Imports of copper, 15,273 tons; exports of copper, 523 tons; consumption, 14,750 tons, as compared with consumption during the same period in 1909 of 11,237 tons. Of the above quantity 13,993 tons was imported from the United States. In London to-day the copper market was steady. Spot sold for £60 5s. and futures

went at £61 2s. 6d. The sales amounted to 500 tons of spot and 700 tons of futures.

Waterbury Average.—The Waterbury average for February was 13.87½c.

Pig Tin.—The demand for pig tin is excessively quiet. Inquiries from consumers are noticeably absent from the market and there was little buying during the week, with the exception of yesterday, when 300 tons were sold. That business, however, was entirely between dealers. Yesterday pig tin was sold for 32.60c. and the trading did not seem to have much effect on prices. Tin sold in New York to-day for 32.45c. In London spot was sold for £147 12s. 6d. and futures for £149 10s. The sales were 450 tons of spot and 400 tons of futures.

Tin Plates.—The building trades are asking for large quantities of tin plates and the mills are still crowded with business. The leading interest continues to quote \$3.84 for 100-lb. coke plates.

Lead.—Lead has fallen off again and the situation is hardly understandable, as it is certain that there must be a good demand for lead when spring activities commence. To-day the price in New York was 4.55c. and the St. Louis market, which is weak again, was down to 4.40c.

Spelter.—Spelter is quiet and the price has fallen off slightly. Inquiries indicate that there will be some good buying shortly, however, and it is thought that the metal will not go much lower for the next few weeks.

Antimony.—Large offerings of the cheaper grades of antimony are tending to make that market very ragged. Plenty of the Hungarian grades can be had at 7.50c., and offerings have been reported at less than that price. Hallett's is 8.25c. and Cookson's 8.50c.

Old Metals.—The market is dull. Dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible.....	13.00 to 13.25
Copper, heavy and wire.....	12.50 to 12.75
Copper, light and bottoms.....	11.75 to 12.00
Brass, heavy.....	9.50 to 9.75
Brass, light.....	7.75 to 8.00
Heavy machine composition.....	11.75 to 12.00
Clean brass turnings.....	8.00 to 8.75
Composition turnings.....	10.25 to 10.50
Lead, heavy.....	4.40 to 4.50
Lead, tea.....	4.05 to 4.15
Zinc scrap.....	4.75 to 5.00

Legal Decisions of Interest to Manufacturers.

ABSTRACTED BY A. L. H. STREET.

General Duty of Employer to Employee.—An employer is liable for injury to an employee from defective machinery, not for danger only, but only for negligence. The fact of such injury will not alone impose liability on the employer. An employer is not bound to furnish the very best and safest machinery and appliances for his employee. So they be such as are reasonably safe, and may be safely used with due care on the part of the employee, the employer is not liable for injury therefrom. The employer is not liable for the mere error of judgment. (West Virginia Supreme Court of Appeals, Sowards *vs.* American Car & Foundry Company, 66 Southeastern Reporter, 328.)

Methods of Work Affecting Employee's Safety.—An employer need not instruct an employee regarding certain work, where the most minute instructions, if given, would only call attention to what was perfectly obvious. He need not adopt the safest known methods, but only such as are reasonably safe, and as would be adopted by a person of ordinary care and prudence. That it would have been safer to have shifted a casting by means of a crane did not render the employer negligent in having the work done by hand; sufficient men being provided for the purpose, and it not appearing that the latter method was unsafe or dangerous when enough men were furnished. (New York Supreme Court, Ozgar *vs.* Pierce, Butler & Pierce Mfg. Company, 119 New York Supplement, 405.)

Employment of Minors.—It is because a child under 14 is likely to be imprudent and negligent, and is, therefore, exposed to greater danger to himself and others, that his employment in industrial establishments is forbidden by the laws of Pennsylvania. (Pennsylvania Supreme Court, Stehle *vs.* Jaeger Automatic Machine Company, 74 Atlantic Reporter, 215.)

Emery Wheel Dust.—The Indiana Statute requiring exhaust fans to be provided to carry off dust from emery wheels, includes particles of emery and iron thrown and blown off the wheels while in operation, as well as any dust likely to be present in rooms in which dust creating machines are operated, the word "dust" meaning fine, dry particles of matter that may be raised and carried by the wind, there being no rule to determine the size of the particles nor the matter of which they are composed. (Indiana Appellate Court, Division No. 2, Indianapolis Foundry Company *vs.* Bradley, 89 Northeastern Reporter, 505.)

The Machinery Trade.

NEW YORK, March 9, 1910.

Business has fallen off noticeably in the metropolitan district. With the exception of one large machinery house, which claims to have booked several large orders on which the general trade did not bid, most houses report a lack of actual business. Inquiries are good, but prospective buyers seem to be slow in closing up orders. The lack of business is, if anything, welcomed by some houses that are far behind in their orders and, judging from reports received from manufacturers, deliveries are catching up rapidly. In other words, machines which two weeks ago manufacturers could not see their way clear to deliver within seven months are now promised for delivery within from five to six months. The explanation of this is that many manufacturers who make it a point to be prompt in their deliveries make their promises according to the amount of business in sight. When cancellations occur or there is a decided falling off in the demand they are able to cut down their time of delivery materially. If, of course, there should be a sudden influx of business to the dealers, manufacturers would have to again extend their time stipulations. There are no large lists before the trade, but some are looked for shortly.

Men familiar with the railroad conditions declare that there should be some good buying from that source before long, and it is said on good authority that the New York Central Railroad is preparing a list against which it will buy within a short time. The lull in the demand has been of such short duration that it has had no effect on business sentiment, and most dealers are optimistic as to the future.

The second-hand machinery trade continues good, but there are many buyers who have been purchasing second-hand machinery largely because they could not get new equipment for early delivery, and it is reported that there are less inquiries for second-hand material just now. This is not true with the trade in new machines, as inquiries are, if anything, large and the outlook for business in the immediate future is decidedly good. The open weather of the last week has increased the demand for small engines and boilers, such as go into apartment houses and office buildings. It is a strange fact that many people who build such structures wait until the last moment before placing their orders for power equipment, while in the general manufacturing field the power machinery is invariably ordered before other machinery wants are filled.

Machinery dealers are beginning to devote considerable attention to the business that comes from automobile garages. One local firm in particular keeps a man looking after this trade exclusively and it is stated the investment is a good one. An ordinary garage fitted up for regular repair work requires a large and a small drill press, an 18 or 20 in. lathe, milling machine, tool grinders, small tools, motive power equipment, &c. While the individual outlay is not very extensive the tools generally purchased are of the latest pattern, and it is quite probable that a little educating effort expended with the garages now having repair work done outside would pay the machinery people well.

The United Wireless Telegraph Company, 42 Broadway, New York, will erect a reinforced concrete factory building, 40 x 200 ft., two stories and basement, at Florence and Walnut street, Jersey City, N. J. It is the intention of the company to assemble equipment now scattered around the country and make this its sole manufacturing plant on the Atlantic coast. All the machinery will be motor driven and power will be purchased from the Public Service Commission. Frederick A. Waldron, 37 Wall street, New York, has been retained as architect and engineer.

The Alfred E. Norton Company, Boonton, N. J., whose fabricating structural steel plant was partially destroyed by fire last December, has leased the property lately occupied by the Boonton Rubber Company, adjoining its present site, and has started work on a new factory which will contain a 15-ton crane runway, 100 ft. span, 600 ft. long, 300 ft. of which will be covered and fitted up with machinery and equipment for the fabrication of steel. This building, in conjunction with those rebuilt and additions already made since the fire, together with the large amount of new machinery purchased, will comprise one of the most up to date plants of its kind and size in the East.

The Oscar Barnett Foundry Company, Harrison, N. J., which recently purchased property at Lyons and Woolsey avenues, Newark, N. J., where it will erect a plant to cost \$50,000, has been buying rather extensively in the trade of late. The plant is to include a group of one-story brick buildings, which will comprise two foundry buildings, a pattern storage building, forge shop, machine shop, tumbling, sorting and buffing shop, shipping room, power house and office structure. It is understood that some of the equipment the company now owns will be installed in the new structure, but much in the way of foundry material is now being bought.

The Arlington Stamping Company, Arlington, N. J., has

increased its capital to \$100,000 and has built a new factory on Davis avenue, Arlington, 100 x 135 ft. in size. The company is now erecting another building of similar size, which will be an exact duplicate of the new structure and in which a full line of modern machinery for sheet metal work will be installed. E. D. Holley, who for the past 12 years has been factory manager of the Bristol Brass & American Silver Company, Bristol, Conn., is general manager of the stamping company.

The James Fitt Machine Company, Rochester, N. Y., has been organized to take over the general jobbing business and manufacture of special machinery of James Fitt. Its officers are James Fitt, president and treasurer; George S. Bryan, vice-president; Walter Copsey, secretary; Charles P. Bryan, superintendent. The existing plant will be enlarged at an early date.

The Grafton Construction Company, Wheeling, W. Va., will be incorporated probably under a different name and will install stamping presses for the manufacture of sheet metal stamped and piece ware and metal specialties.

The Central Stamping Company of Newark, N. J., is preparing to make an addition to its plant at 591 Ferry street, which will include the erection of several one and two story brick buildings. The company has been getting equipment together to install in the increased space.

The Whitall-Tatum Company, 46 Barclay street, New York, manufacturing chemist, is arranging to build a plant at Keyport, N. J. The requirements include a power plant, the size of which is not known.

The Rockcut Stone Company, Buffalo, N. Y., will install new crushing machinery, including a No. 10 gyratory breaker, revolving screen, elevator, &c. The contract is said to have been already placed.

The New Jersey Waste Metals Company, Perth Amboy, N. Y., has been organized to establish a refinery for recovering the values from scrap metal, particularly the better grades of alloys.

A current changer of 400 kw. capacity, consisting of a synchronous motor and two direct current generators, will be added to the plant of the Niagara Electrochemical Company, Niagara Falls, N. Y.

Purchase of machinery for the new factory of the Superior Motor Vehicle Company, Buffalo, N. Y., plans for which were recently referred to in *The Iron Age*, will be made in about three or four weeks. The complete layout has not yet been decided upon.

The Clinton Point Stone Company, New York City, contemplates extensive additions to its quarry and crushing machinery at Clinton Point, including the installation of a gyratory breaker of the largest size ever built.

The Virginia Box & Column Company, recently organized at Alta Vista, Va., by H. L. Lane, will establish a plant there equipped with power and woodworking machinery.

The Electric Piano Operating Company has been incorporated at Binghamton, N. Y., capitalized at \$100,000, to manufacture pianos, organs and other musical instruments and parts. The incorporators are D. F. Simpson, A. Robertson and L. H. Harris, Binghamton.

The Penn Yan Flexible Conduit Company, Penn Yan, N. Y., has been incorporated, with a capital stock of \$75,000, and will build and equip a plant for the manufacture of electrical conduits, insulators and other electrical supplies. Wm. T. Morris, Jerome S. Wheeler and Geo. S. Sheppard are among the incorporators.

The United States Motor Company has elected the following officers: President, Benjamin Briscoe; vice-presidents, John B. Maxwell, Carl Tucker, W. F. Crosby and H. W. Nuckles; treasurer, Carl Tucker; assistant treasurer, J. W. Wellington; secretary, F. D. Dorman; assistant secretary, W. F. Crosby.

The Brown-Lipe Gear Company, Syracuse, N. Y., is building a factory of reinforced concrete, six stories in height, which will have about 100,000 sq. ft. of floor space. The company has purchased all the additional machinery it will require.

Business Changes.

The Barron & Cole Company, Franklin street and West Broadway, New York, owing to the increased demand for second-hand contractors' equipment, is opening up a special department to handle this particular line and has put George E. Ray in charge as manager. He was formerly of the Russell Contracting Company, New York.

Chicago Machinery Market.

CHICAGO, March 8, 1910.

Conditions in this market continue very satisfactory. The Western railroads are awakening to the fact that rolling stock is not in good shape and that extensive additions for shop equipment will have to be made in order to keep up with the repair work. It is generally understood that many appropriations have been asked for, and now that the freight departments are beginning to feel alarmed over the situation and are asking for relief, no doubt several large

lists for machine tools and new rolling stock will be made public at no distant date. The automobile trade is still very encouraging, and one feature in particular, to which allusion has been made in these columns previously, is the large aggregate business for machine tools that comes from the garages that are being built all over the country. Dealers in both new and second hand power plant equipment claim there is no room for complaint, and taking everything into consideration the general situation is about as favorable as could be expected.

The Elkhart Motor Car Company, Elkhart, Ind., has increased its capital stock from \$200,000 to \$1,000,000, and is preparing plans which will double the capacity of its present plant. It is expected that the new plant when completed will employ about 2000 men.

It is now officially announced that the Baltimore & Ohio Southwestern Railroad will make improvements at its shops at Washington, Ind., aggregating a cost of \$61,000. Improvements to be made in the machine shop will require a large portion of the money to be expended, but other improvements will also be made, including the installation of an electric railway for hauling locomotives from one end of the shops to the other.

The Clover Leaf Railway Company has appropriated the sum of \$225,000 to be expended in enlarging its shops at Frankfort, Ind., and erecting new buildings. A new roundhouse, new machine shop and coach shop are to be built.

The De Tamble Motors Company, Anderson, Ind., is preparing to make extensive improvements to its plant, and about \$9000 worth of new machinery is to be installed. The company will also increase its working force from 235 to 370 men. The increase of 135 men will be put on as a night force.

The Crown Die & Tool Company, Chicago, has been incorporated with capital stock of \$8000 to manufacture and deal in tools and machinery and apparatus. The incorporators are: Roger Sherman, William R. Tucker and James E. Munroe.

The Overland Automobile Company, Indianapolis, Ind., has completed arrangements for the erection of a new fire-proof building at Fifteenth street and the Big Four Railroad, which will be used for grinding cam shafts. The new building will provide about 10,000 sq. ft. additional working space.

The White Steamer Automobile Company, Cleveland, Ohio, has prepared plans for the erection of a new factory building at Salt Lake City, Utah, which will cost approximately \$50,000. The building will be 75 x 132 ft., three stories and basement, and will be used for the manufacture of automobile bodies and the repairing of all parts of machines. Most of the basement and a part of the first floor will be used as a garage, and the top floor will be used for shop purposes. It is expected that the building will be finished and ready for occupancy by the first of June. P. R. Melchert will be manager of the enterprise.

The construction of a pumping plant to be put in service during the coming fall is being planned by the municipal authorities at New Athens, Ill.

The power equipment of the Barnes Drill Company's new plant at Rockford, Ill., which will be operated by motors throughout, includes an electric generator driven by a Corliss engine of 125 hp., with the usual auxiliary apparatus. It is stated that no contract for this machinery has as yet been closed.

Some new apparatus, including one or more large revolving iron frame screens, is required by the Universal Crushed Stone Company. It may, however, have already been purchased. The company's main office is in Chicago.

A steam driven hoist is to be purchased shortly by the American Concrete Company, Chicago, Ill.

The E. Z. Opener Bag Company is planning construction of a large factory at Taylorville, Ill., which will be electrically lighted throughout. Details of the equipment have not yet been fully worked out.

From Kewanee, Ill., it is reported that the Kewanee Boiler Company has had plans drawn for additions to its foundry, machine shops, boiler shop and other departments, including the equivalent of five complete buildings.

The Illinois Concrete Machinery Company has been organized at Princeton, Ill., to operate a plant for the manufacture of contractors' outfits.

Erection of an additional woodworking shop is said to be contemplated by the Rock Island Sash & Door Works, Rock Island, Ill.

There will be some extension this season of the manufacturing facilities of the Aurora Automatic Machinery Company, Aurora, Ill.

The Commercial Mfg. Company, East Peoria, Ill., may in the near future add some motor driven tools and other apparatus to its shop equipment.

From Frankford, Ind., it is reported that a large line of shop equipment will be purchased for the railroad shops there. Some new buildings may also be erected.

The American Sintering Company, Chicago, will provide power equipment for its plant, including an engine of

300 hp. and a 200-kw. generator for direct current, with auxiliary apparatus.

The Locke Mfg. Company, Robinson, Ill., has purchased a site of 1½ acres at Huntington, Ill., on which will be erected an up to date plant for manufacturing iron, brass and aluminum articles. Three buildings, 100 x 150 ft., of brick, will be erected. Information as to equipment required may be obtained by addressing the company direct.

The Moline Pressed Steel Company, Moline, Ill., has been incorporated for \$25,000, to manufacture pressed steel and sheet metal parts. The company has purchased a site containing 2½ acres and is having plans drawn for a factory building of saw-tooth type.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 8, 1910.

Local machinery merchants report rather quiet conditions during the past week; manufacturers, however, have had a fair run of orders, mostly from customers outside this immediate vicinity. Unsettled labor conditions have interfered with local business to a considerable extent. The strike of many of the car men of the Philadelphia Rapid Transit Company, now of 15 days' duration, has crippled transportation facilities, while a sympathetic strike of a number of union men in various trades, which was called on March 5, has interfered greatly with the operation of many industrial establishments. As the larger plants in the iron, steel and machinery trades are mostly operating on an open shop basis, they have not been greatly interfered with. The Baldwin Locomotive Works, Midvale Steel Company, Wm. Cramp & Sons Ship & Engine Building Company, Wm. Sellers & Co., Southwark Foundry & Machine Company and other large manufacturers are operating on an unchanged basis. The Niles-Bement-Pond Company has had some difficulty in its foundry department, while the Standard Roller Bearing Company has had men in several departments walk out. A number of the smaller plants have, however, been seriously crippled. The textile and the building trades are probably the most seriously affected.

There has been a little more movement recently in railroad shop equipment, some few orders having been placed by the Baltimore & Ohio Railroad. The Pennsylvania Railroad is making minor purchases, and is expected to come into the market shortly for the equipment of its proposed shops at Cape Charles, Va. A good portion of the orders against the recent list of the Norfolk & Western Railroad are understood to have been placed. No new developments are noted in the foreign demand for machine tools; this branch of the trade still drags.

The second-hand machinery trade has not been very active, nor has the second-hand boiler and engine trade, although there is a better demand and a greater volume of business has been done in new equipment of the latter character.

The operation of some of the local gray iron foundries has been interrupted by the sympathetic strike above referred to. The demand for machinery castings continues quite active, and deliveries, particularly in steel castings, are much delayed. Generally speaking, the volume of business coming out is on a fairly even basis.

It is understood that the city officials of Wilmington, Del., have under consideration the question of installing a municipal electric lighting plant, utilizing water power in connection with one of the city reservoirs.

The Board of Water Commissioners, Reading, Pa., Edward Elbert, president, will receive proposals until March 22 for cast iron pipe and special connections, cast iron gate boxes, laying water and supply pipe and the building of a high service pumping station. Plans, specifications, &c., can be had at the office of the superintendent and engineer, 25 North Eleventh street, Reading, Pa.

The Philadelphia Ship Repair Company is building a one-story brick machine shop, 55 x 188 ft., at Delaware avenue and Mifflin street, to replace the shop recently destroyed by fire. We are informed that no additional machine tool equipment will be required.

The Hilles & Jones Company, Wilmington, Del., has recently placed orders for additional machine tools to complete its equipment. Its shops are running full handed and part overtime in order to meet urgent demands for some of its tools. Actual orders taken in February were not quite as many as those taken in the previous month, but indications are considered favorable for continued active conditions.

H. B. Underwood & Co. report business during the month of February as being fully up to the average. The demand for railroad repair shop tools is opening up quite satisfactorily and orders booked are sufficient to keep the plant well engaged for some time ahead.

The Philadelphia & Reading Railway Company will receive bids until March 23 for construction work appurtenant to the abolition of grade crossings on the Philadelphia, Germantown & Norristown Railroad in this city. Under

contract No. 47 bids will be received for signal bridges, Green street to Norris street, and Seventeenth and Indiana avenue to the Richmond Branch of the Philadelphia & Reading Railway. Contract No. 48 covers a toolhouse to be erected at Norris street. Specifications may be had from the chief engineer, W. Hunter, Reading Terminal, on payment of a deposit to insure their return.

The Chester Engineering & Machine Company, Chester, Pa., has booked during January and February orders exceeding twice the volume of business done in the same months last year. This concern has received a number of orders for gasoline motors as well as for general work on automobile parts, and looks forward to very active business conditions during the year.

William A. Moore, Joshua B. Lessig and William L. Coover, receivers of the Duncannon Iron Company, Duncannon, Pa., will sell on March 17, under decree of the court, the real estate, buildings, mills, machinery, general equipment, &c., of that company located at Duncannon, Pa., subject to a mortgage indebtedness of \$37,000. A complete description of the property to be sold may be obtained on application to David Wallerstein, attorney, 607 Land Title Building, Philadelphia, Pa.

The Southwark Foundry & Machine Company reports a decided betterment recently in the volume of inquiries received as well as orders taken for heavy engines, condensers and their general line of specialties. Several good sized orders, including rolling mill engines, were booked the past week. The company's plant is operating on a very satisfactory basis.

The Hub Machine, Welding & Contracting Company, Philadelphia, has been incorporated under the Pennsylvania laws, with a capital of \$100,000. B. F. Lare is president; E. E. Pennock, vice-president, and Robert Morris, secretary and treasurer. The new corporation will absorb the Hub Machine & Tool Company and the Mechanical Mfg. Company, and has taken the entire building at 621 Cherry street, giving it about 20,000 sq. ft. of floor space, devoted to the manufacture of the Acme metal saw table and other tools, electric welding and general machine work. A considerable quantity of additional tools and equipment will be required for the extension of the company's plant.

New England Machinery Market.

BOSTON, MASS., March 8, 1910.

A recovery from the feeling of unrest which has been afflicting industry is evident in many directions. The general opinion now is that the slightly depressing influence of the stock market slump was unwarranted by actual basic conditions, and in consequence confidence has returned. The machine tool trade in Boston has seen little if any falling off. February was a very good month with most of the machinery houses. Two large supply houses report that the year ending March 1 was the largest in their history. The machinery people can make no such statement as this, but the year has begun with a very comfortable business.

Deliveries continue to recede slowly. Some sizes of radial drills have been added to the list of late shipments. Certain lathes and vertical drills are in the same condition. Planers are not so easy to find. With the milling machines, grinding machines, gear cutters, screw machines and the automatics generally conditions of deliveries are going from bad to worse. The tendency to advance prices continues, the average slowly going up.

The Fairbanks Company has been given the agency for the new sensitive drill press and the grinding machines of W. H. Leland & Co., Worcester, Mass.

The plant of the New Milford Foundry & Machine Company, New Milford, Conn., which was burned March 1, will be rebuilt, according to the present plans of the owner, Jasper A. Northrop. The foundry is one of the oldest in Connecticut, having been in operation for 70 years. The loss by the fire was \$20,000, including the valuable patterns.

The Vulcan Iron Works, New Britain, Conn., manufacturer of gray and malleable iron castings, will erect another new building, 40 x 120 ft., two stories, to be used for manufacturing and shipping purposes. The new foundry building, already mentioned, is nearing completion.

The Vanadium Metals Company, Pittsburgh, Pa., has purchased the foundry and business of the Victor Metals Company, East Braintree, Mass., and will operate the works for the manufacture of vanadium bronze, brass, aluminum, noncorrosive silver metal and anti-friction metal. Victor C. Lassen will remain as superintendent of the works.

The receivers of the West Mystic Mfg. Company, West Mystic, Conn., builder of gasoline engines, have been authorized by the court to sell the property, which is appraised at \$48,000.

A controlling interest in the Berkshire Motor Company, Pittsfield, Mass., has been purchased by Stuart H. Clapp and James Addison of that place. The announcement is made that the works will be enlarged as soon as the present season's output of cars has been completed, so that production

will be on a larger scale next year. Mr. Addison will be the president and treasurer and Mr. Clapp vice-president and sales manager.

Recent fires include the Brown-Talbot Machine Company, Salem, Mass., loss \$10,000, and the Springfield Facing Company, Willimansett, Mass., loss \$15,000.

Additions to general manufacturing plants outside of the metal trades include the following: Oxford Linen Mills, North Brookfield, Mass., two large four-story mill buildings; Elm Refining Works, Stamford, Conn., two-story building, 40 x 115 ft.; Phillipdale Paper Company, Phillipdale, R. I., building 68 x 156 ft., two stories and basement; West End Thread Company, Millbury, Mass., building 35 x 40 ft.; new company, headed by John C. Robinson, Springfield, Mass., storage warehouse in that city to cost \$300,000; Fairfield Rubber Company, Fairfield, Conn., one-story addition 30 x 50 ft., for spreader room.

George G. Prentiss & Co., New Haven, Conn., have brought out two additions to their line of multiple spindle automatic turret machines. One is a five-spindle machine designed for drilling and facing and tapping forgings from the solid, the process comprising the use of both roughing and finishing tap. The other new tool is a four-spindle machine, designed especially for boring, drilling and facing, with no provision for threading, the builders having especially in mind the needs of the automobile manufacturers.

The Roger Raymond Mfg. Company, Mystic, Conn., has incorporated with capital stock of \$50,000, to manufacture a bin flour sifter and automobile accessories. A shop has been leased for the purpose.

The Robbins Machine Company, Worcester, Mass., is bringing out a new line of engine lathes, up to and including the 14-in. size, built for heavy work and having a quick change feed mechanism.

The American Tube Bending Company, New Haven, Conn., has begun the manufacture of manifolds for automobile gas engines from brass, copper and steel seamless tubing, the plant being equipped with machines especially designed by J. H. Bradnack of the company, who has been engaged in the work for years. From 40 to 50 men will be employed. It is a Connecticut corporation, of which H. S. Munson is president and treasurer and Mr. Bradnack secretary.

Announcement is made at Springfield, Mass., that the Bosch Magneto Company, New York, has acquired a large tract of land in the suburb of Brightwood and will erect factories for the manufacture of magnetos. Three large buildings are planned, each 66 x 385 ft., of reinforced concrete, and the construction of the first will begin this spring.

The Bryant Electric Company, Bridgeport, Conn., will erect a three-story factory addition, 60 x 147 ft., three stories.

The contract for a 15,000,000-gal. pumping engine has been let by the New Haven Water Company, New Haven, Conn.

A municipal power plant for lighting service may be installed this year by the town of Blackstone, Mass.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 8, 1910.

The general tone of the market is somewhat better and the volume of business, which is still mostly in small orders, shows an improvement over February. Dealers generally report a larger number of inquiries, so that more actual business is in sight than for several weeks. Local machine tool builders as well as the dealers state a satisfactory amount of business has been received. The demand for drilling machines continues good; it has become more general, a smaller percentage of the tools going to the automobile trade, and orders are more for the larger sized tools than they have been for several months. Makers of radial drills are booking more orders from the railroads, but they are mostly for single tools. The demand for forging machinery is also reported good. Small inquiries for automatic machines show considerable increase in number. Plants for the manufacture of automobile parts and accessories continue to spring up in this territory and there is a steady call from this source for machine tools, mostly in small sizes. The requirements of the automobile trade are given credit for the large share of trade for foundry equipment and supplies, which at present is very heavy. Two new companies recently formed in this city will at once begin the erection of foundries for the manufacture of aluminum, brass and bronze castings, largely for the automobile trade. Some of the larger automobile manufacturers are also planning to add to their plants in order to do more in the way of making their own castings and other parts. The demand for drop hammers and presses for new drop forge plants and for enlarging the capacity of those already in existence is quite active. Some good inquiries are pending.

In the foundry trade conditions are generally satisfactory. The local gray iron foundries have about all they can do and foundries making heavy castings have a good volume of work.

The A. B. C. Castings Company, Cleveland, which was recently incorporated with a capital stock of \$100,000, has commenced the erection of a large foundry for the manufacture of aluminum, brass, bronze and copper castings on Carnegie avenue, near East Sixty-fifth street. The building will be 125 x 350 ft. The plant will be provided with the latest foundry equipment. Some of this has already been contracted for and the company is in the market for the remainder. A. D. Levy is the leading organizer of the new company and has associated with him a number of other Cleveland men who are experienced in this branch of the foundry business. Officers have not yet been chosen. The company's headquarters at present are at 144 The Arcade. It is the intention to have the plant ready for operation during the spring.

The Comstock-Wellman Bronze Company, Cleveland, recently organized, with \$25,000 capital stock, for the manufacture of brass, bronze and aluminum castings, has secured a site at 6017 Superior avenue and will at once begin the erection of a plant 50 x 100 ft. in size. The company is in the market for the necessary foundry equipment. Officers have been elected as follows: President, C. W. Comstock; vice-president, S. T. Wellman; secretary and treasurer, F. S. Wellman.

The Superior Drop Forge & Mfg. Company, Cleveland, has been incorporated, with an authorized capital of \$150,000, by W. H. Lucas and others, to build a drop forging plant. The company announces that it will buy about 12 hammers and presses and will also need considerable machinery for a machine shop. It is now in the market for the machinery equipment. Fulton V. Eurich, 5710 Bridge avenue, is general manager of the company.

A new company for the manufacture of automobile accessories, in which H. L. Schneider, 313 Electric Building, and others are interested, is being organized in Cleveland. It is expected that the contracts for the machine tool requirements will be placed very soon.

The J. D. Smith Foundry Supply Company, Cleveland, reports a large volume of orders for ovens, furnaces and other foundry equipment. This company has recently received the following orders: Ovens and brass and aluminum furnaces for the Packard Motor Car Company, Detroit, Mich.; core ovens for the E. M. F. Company, Detroit, Mich.; two ovens for the Lozier Motor Car Company, Plattsburg, N. Y.; four ovens for the A. B. C. Castings Company, Cleveland; one oven for the Michigan Motor Castings Company, Detroit, Mich.; one oven and other equipment for the F. I. A. T. Company, Poughkeepsie, N. Y.; one aluminum and coke furnace for the Standard Brass Foundry Company, Cleveland, and a core oven and aluminum furnace for the National Bronze & Aluminum Foundry Company, Cleveland.

The Ferro Foundry & Machine Company, Cleveland, which will build a large addition to its machine shop, as announced last week, expects to be in the market shortly for some special tools and foundry equipment, but will need few if any standard tools. The Ferro Company has purchased about \$50,000 worth of new machinery during the past four months and its present machine shop is overcrowded with tools. The erection of an addition 140 x 160 ft., for which contracts have been let, will relieve this congestion. The company reports that it is rushed with work in its castings department and that the outlook for a good year's business in its marine engine department is very bright. Its 1910 business is expected to show an increase of fully 30 percent over that of 1909.

The Deming Company, Salem, Ohio, has prepared plans for the erection of a large addition to its plant, on which work will be started shortly. The new building will be 50 x 193 ft., four stories, and of brick and fireproof construction. A portion of the building will be used for a pattern room and other parts for storage. Elevators and a sprinkling system will be installed. The company may decide to erect other additions during the year.

The Business Men's Association of Sandusky, Ohio, is negotiating with the Schacht Mfg. Company of Cincinnati for the removal of its automobile plant to Sandusky. The deal is understood to be about closed. By the terms of the agreement the Schacht Company is to spend \$50,000 for buildings and equipment.

The Foote-Burt Company, Cleveland, maker of drilling machines, reports that the volume of its February business was above the normal. The company has a large number of orders from automobile companies on its books, and it reports that the general demand from other sources, including the railroads, is improving, orders now running to larger sized tools than are generally used by the automobile trade. This company is now 90 days or more behind on deliveries.

The Ajax Mfg. Company, Cleveland, reports a satisfactory volume of orders for forging machinery and some good inquiries pending. The company is well filled with work and has a night force employed in some of its departments.

The Cuyahoga County Building Commission, 425 Garfield Building, Cleveland, will receive proposals March 23 for installing complete refrigerating machinery for a drinking water system, and also proposals for installing a complete vacuum cleaning plant for the Cuyahoga County Court

House. Plans and specifications can be seen at the offices of the commission and French & Hubbard, engineers, Boston, Mass.

The Baxter Stove Company and the New Method Stove Company, Mansfield, Ohio, whose plants were recently destroyed by fire, have secured temporary quarters which will be used until new plants can be built. Both companies have placed orders in the local market during the week for machinery to equip their temporary plants.

The Cleveland Twist Drill Company reports that business conditions continue very satisfactory. At the beginning of the year the company found the capacity of its plant taxed with a large volume of specifications and night work was necessary to catch up on deliveries. New orders are plentiful and some of the company's departments are still running overtime.

Announcement is made by the purchasing department of the Lake Shore & Michigan Southern Railroad that it may be a year before the list is prepared of the machinery requirements for the new shops that that company will erect in Elkhart, Ind. Preliminary work on the site is expected to be started shortly, but it is stated that the new shops will not be completed until 1912.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 8, 1910.

March trade progress has been more pronounced thus far than in the corresponding period of February. It is rather in the tone and the undercurrent, however, for on the surface there would seem to be but little change. There has been considerable business transacted quietly in the machinery and tool lines, particularly the latter. Dealers in second-hand tools have been especially busy. Large dealers attribute this activity in used machinery to the fact that few manufacturers of the heavy tools, for which there is an increasing demand just now, can promise deliveries earlier than 30 to 90 days, and some from five to six months. For these used tools good prices are being obtained. Sales include power generating devices, and the majority of these hurry sales are for quick installations in electric light plants, cement works, stone crushing plants and miscellaneous manufacturing shops. Among these—and showing the diversity of the demands and variety of installations—one concern has within the past few days sold an entire outfit (used) for a 500-hp. concrete manufacturing plant in Columbus, Ohio; 300-hp. water tube boiler to a Louisville manufacturer, 200-hp. gas engine for a West Virginia plant, 200-hp. boiler for installation in an Indiana stone crusher plant and a compound pump for use in an Indiana stone quarry.

Machinery dealers report the best demand and sales for the heavier types of tools, and the automobile manufacturers are still the largest buyers. Milling machines, high speed upright drills and gear cutters are enjoying a special run in this market.

Among the projected machine tool improvements for spring the plans of A. C. Hoefinghoff and George C. Kimmel, both widely known in tool manufacturing circles, are probably the most important at this time. These gentlemen have been in Cincinnati but a month, but in that time have been quietly working out their ideas, which have been under consideration for a year or more, and active work will begin within a few days on a new machine tool establishment, their enterprise to be known as the Cincinnati Grinder Company. The special product to which their attention will be first given will be the heaviest grinder on the market—a universal No. 2, designed by Mr. Kimmel, who was for six years designer and superintendent in the works of the Heald Machine Company, Worcester, Mass., and formerly identified with the Norton Company. Mr. Hoefinghoff is a member of the well-known Cincinnati family of that name, which was conspicuous in the management of the old Bickford Tool Company, and with which concern he was identified prior to his Eastern connection as sales manager of the Heald Company. The location of the plant, which can only be stated at this time, will be in the Spring Grove avenue tool manufacturing district. The list of tools has been bought and includes Cincinnati planers, Cincinnati millers, Lodge & Shipley patent head lathes, Cincinnati-Bickford 24-in. high speed vertical drill, Bickford 5-ft. radial, Blount floor grinders and speed lathes, Whitney hand millers, &c.

Lathe manufacturers report business quiet in the larger sizes, but medium and smaller sizes going as well as if not better than usual. A number of lists which include lathes and which have been pending since the first of the year are not yet closed, but are expected to materialize this month.

Although suffering from the ravages of a fire which destroyed a goodly portion of its plant, the Baxter Stove Company, Mansfield, Ohio, lost no time in its foundry, which was practically untouched, and began immediately to rebuild. Through the courtesy and kindness of neighbors the office part of the business was transferred temporarily, and save

for the pecuniary loss and inconvenience resulting from confusion the company has lost little in business.

Some interest is shown in tool circles over the announcement that the Baltimore & Ohio Railroad Company is considering the erection of large car repair shops on the ground at Piedmont, W. Va., formerly occupied by roundhouse, machine, blacksmith and other shops. The new establishment, it is said, will be used for the repair of steel gondola cars in the service of the road.

It is reported from Wheeling, W. Va., that the Wheeling Mold & Foundry Company is arranging to put its business on an 8 per cent. dividend basis. It was shown at a recent meeting of the stockholders that the books at the opening of 1910 indicated an increase of \$78,234.92 in resources over the preceding year.

The Malleable Iron Company, Zanesville, Ohio, is erecting a new melting furnace and the capacity of the plant is being increased in several departments. The number of operatives will be doubled when the improvements are completed, and about one-third of the additional men required will be skilled workmen.

A new lamp invented by Manager J. J. Wood of the Fort Wayne Electric Works, Fort Wayne, Ind., is soon to be placed on the market.

The extension to the east foundry at the plant of the Dodge Mfg. Company, Mishawaka, Ind., is rapidly nearing completion. The building, which is 80 x 360 ft., is an important addition to the Dodge group of buildings. The equipment provides for molding and pouring continuously throughout the 24 hours. Monorail electric traveling hoists will serve the floors, and the standard span type of electric crane will do the work of charging cupolas.

The new officers and directors of the Novelty Iron Works, Canton, Ohio, are as follows: President, Sol Toron-ski; vice-president, J. W. Steiner; secretary and treasurer, H. E. Sherlock; directors, W. E. Krumlauf and C. Bosche. W. E. Sherlock retired from the presidency to devote himself more closely to some of his other business interests, but retains his interest in the organization. D. R. McCallum retired as vice-president of the company.

The jobbing foundries are all busy, and some are increasing the size and frequency of heats. The lull of the past eight weeks in machinery and tool manufacturing circles seemed to affect the foundrymen but little, and in most cases not at all. Orders for machine tool castings are engaging the attention of the majority of the local jobbing foundries, and many of these are for the heavier types of tools, such as planers, radial drills and large lathes. An increase of interest in locomotive cranes and heavy conveying machinery of all kinds is reported.

Bidders are asked by City Clerk William F. Krueger of La Porte, Ind. (closing March 14), to submit proposals for furnishing iron or steel posts at least 10½ ft. long over all, with provision for setting post 2½ ft. in ground, in multiples of 100 up to 500, and also signs, doubled faced, to fit clamps on top of sign posts, in multiples of 400 up to 2000.

Milwaukee Machinery Market.

MILWAUKEE, WIS., March 7, 1910.

The machinery market is rather quiet at present. Manufacturers of shop and foundry equipment are disposed to catch up on deliveries as far as possible and to let new business go for the present, unless it can be obtained at prices sufficient to pay for overtime work or the use of night shifts. Both of these arrangements for increasing the capacity of metal working establishments are being utilized to a considerable extent, but there is not much profit in either, and manufacturers prefer, as a rule, to run as close as possible to the normal capacities of their shops, feeling that in this way they can obtain the best operating economy. Some concerns here, as well as elsewhere, are eager to secure all the business they can possibly crowd through their plants, but the general tendency at this time is not in that direction.

The heaviest rush now in progress is in getting out machinery for building and repair construction work, including equipment for contractors of all kinds. Some of these put off making purchases until the last minute and are now clamoring for deliveries. Every indication here points to an early spring and to the fact that construction work of every description will be undertaken throughout the Northwest on a scale absolutely unprecedented. This has a very stimulating influence upon the machinery market, particularly as affecting dealers' stocks.

In the production of accessories used in field work the small local shops are also kept occupied, and this tends to relieve manufacturers of standard apparatus from competition on their part. Such competition does not, of course, seriously reduce the volume of sales of any of the established machinery houses, but during the fall and early winter months it was one of the influences that worked against a higher level of prices. For this reason it is well to have it

turned into other and more legitimate channels just as far as possible.

The present year witnesses an era of development on the iron ranges such as has not been seen for at least 20 years, and, quite apart from such influence as this may have on the production of iron and steel, it is apparent that among the communities of northern Wisconsin, Michigan and Minnesota the aggregate of contracts placed will be very much greater than has heretofore existed. The mining, transportation and dock companies are not only buying heavily for their own needs, but they appear to have been making a concerted effort of late to encourage various towns and cities in the establishment of electric power and lighting plants, pumping stations for water works and securing local industries in the shape of foundries, machine shops, factories and mills. In the promotion of these local improvements the Oliver Iron Mining Company, Cleveland-Cliffs Iron Company and the Schlesinger interests of Milwaukee appear to have been the most prominent, although the large copper producers of the upper peninsula are, perhaps, equally deserving of credit. Visitors from that entire section, from Ishpeming to Eveleth, to whom there have been many in Milwaukee and Chicago lately, are enthusiastic over its prospects and determined upon boosting the industrial growth of their respective communities. An interesting side light is also thrown upon this activity by the local reports in relation to stores, residences, churches and public buildings now being erected throughout the iron and copper producing districts. These are fully as numerous and indicate a greater degree of purchasing power than those which come from the more populous, long settled sections of the same States.

No recent event has aroused so much interest locally as the reported absorption of the Vulcan Iron Works, Toledo, Ohio, by the Bucyrus Company of South Milwaukee. This means a large increase in the trade of the Milwaukee company and may result in the ultimate concentration here of the manufacturing facilities of the consolidated interests.

A motor driven air compressor of 6000 cu. ft. capacity per minute is being installed at the Daly-Judge mine in Summit County, Utah. It was built at the shops of the Nordberg Mfg. Company in this city.

A new line of production has been undertaken by the Wausau Box & Lumber Company, Wausau, Wis., and it is probable that before fall additional power and operating machinery will be required.

Contract for the new boiler of 120 hp. to be installed at the municipal power plant in Oconomowoc, Wis., has been let to the Milwaukee Boiler Company.

Some woodworking machinery and possibly electric motors will be needed this summer for the new plant of the Hackner Altar Company, at La Crosse, Wis.

Considerable new equipment, including a dozen or more heavy motors for alternating current, will be installed in the foundry of the Belle City Malleable Iron Company, Racine, Wis., which is reported to have decided upon a largely increased production.

A new factory, electrically operated throughout, is to be erected for the Janesville Batten Mills, Janesville, Wis., whose buildings were recently destroyed by fire. Sprinklers and blower systems will also be used.

The Wisconsin Engine Company, Corliss, Wis., has taken contract for a large rolling mill engine to be installed in the new plant of the American Rolling Mill Company, Middletown, Ohio.

Boilers, engines, electric generator and a large quantity of mechanical appliances will be required for one of the largest private power plants in this State, designed for installation at the St. Joseph's Academy, Green Bay, Wis. Foeller & Schober of that city are in charge of the plans.

Among orders recently taken by Fairbanks, Morse & Co. for execution in their factory at Beloit, Wis., are contracts covering a large number of gasoline engines to be used for mining and irrigation service in the Southwest. A gas producer, gas engine and dynamo have been sold to the Huntsville Light & Power Company, Huntsville, Texas, which will utilize lignite fuel. For the Fremont Development Company, to be used in Wyoming, a gasoline engine driven hoist of 40 hp. will be furnished, together with accessory machinery. Other orders for larger units are also in hand.

A manufacturing plant is to be built at Eau Claire, Wis., by the Girnau Mfg. Company, recently organized, which has been incorporated in order to enter upon the construction of contractors' machinery, including concrete mixers. No details as to equipment have been announced.

The plant occupied by the Proctor Metal Mfg. Company, Milwaukee, was damaged by fire to such an extent that it will be necessary to reconstruct it.

From Manitowoc, Wis., it is reported that the business interests of that city, whose efforts to secure new industries were recently referred to, has obtained assurances from a large steel company in Pittsburgh that it will build a rolling mill there if given proper local support. Further developments are awaited.

The new buildings of the Beaver Dam Malleable Iron Company, Beaver Dam, Wis., are practically completed, and in the molding department operations were recently started.

Daniel J. Christopher, Portage, Wis., is in the market for a small gas engine to be used in construction work.

The Clinchfield Portland Cement Company, which is about to erect a large plant at Kingsport, Tenn., has placed contracts in Milwaukee for the bulk of the machinery, both power and operating, including two rotary kilns, 8 x 125 ft.; three dryers, 6 x 60 ft.; a No. 9 gyratory crusher, elevator and other apparatus, and two steam turbines and generators of 750 kw. each. It will be the first plant of its kind in that section of the country to be electrically operated throughout, and the order includes a line of alternating current motors.

Bids are about to be taken for an engine and generator of about 75 kw. and other mechanical and electrical apparatus to be installed in the new plant of the Bradley Knitting Company, Delavan, Wis. The construction engineers, who will let all contracts, are the Hirschberg-Williams-Washburn Company, Milwaukee.

The plant of the Milwaukee Stamping Company, located just back of the Allis-Chalmers Works at West Allis, Wis., has been destroyed by fire, the estimated loss being \$150,000, which is largely covered by insurance. It is probable that temporary arrangements for continuing the company's work will have to be made, pending construction of new shops, as it had contracts in hand covering several months' delivery.

The roundhouse and repair shop of the Soo Line, at Park Falls, Wis., which recently burned, may not be replaced, but if they are the capacity of each will be enlarged and tools for heavier work installed.

A plant will be established at Edgerton, Wis., by the Edgerton Wagon Company, recently incorporated. No large quantity of equipment is, however, likely to be required for the present.

A 500-hp. Corliss engine of Filer & Stowell Company's build has been put in service at the plant of the A. H. Stange Company, Merrill, Wis.

The matter of installing centrifugal pumps for high pressure fire service in the Menominee Valley at Milwaukee has been actively taken up in the Common Council, and the City Engineer will be called upon to submit plans covering pipe lines and machinery.

It is expected that by autumn the Milwaukee Electric Railway & Light Company will be prepared to take up the matter of machine tools and other equipment for the large car building and repair shops which it intends to erect on the western outskirts of Milwaukee. C. D. Wetmore, who recently resigned as vice-president, will be succeeded by Jas. D. Mortimer.

The plant of the Northern Hydro-Electric Company of Green Bay, Wis., is nearing completion at High Falls, on the Peshtigo River, and industries in that section, including traction and lighting companies, are preparing to use the current from this station as soon as it is available.

The Pressed Steel Tank Company, West Allis, Wis., which has its new shops in operation, is preparing to enter more extensively upon the manufacture of seamless steel barrels. These have been introduced to the trade with notable success and offer practically unlimited opportunities for sale. Harry C. Cole, who is now with Allis-Chalmers Company, will shortly become secretary of the Pressed Steel Tank Company.

The Abresch-Cramer Auto Truck Company has been organized with \$20,000 capital by interests identified with Chas. Abresch Company, Milwaukee, for the manufacture of industrial cars. The equipment is provided for, but more will undoubtedly be needed later in the year.

Contract for a motor generator set of 200 kw. has been placed here by the American Steel Foundries Company, which is making some changes in the electric layout of its shops at Thurlow, Pa.

A motor driven pump of small capacity will be installed by the city of Plymouth, Wis., for sewage service.

An engine and belted generator of 300 kw., with exciter and other apparatus, will be installed by the Chas. A. Krause Company, Milwaukee, as part of the equipment of its new plant, which is to be electrically operated throughout.

It is reported from Beloit, Wis., that the Warner Instrument Company has commenced work on foundations for an addition to its factory, 32 x 100 ft., which will be used for a brass foundry, plating and polishing department.

The construction of an independent system of municipal water works, with modern high duty pumping engines of the horizontal crank and flywheel type, is under consideration at Oshkosh, Wis.

An addition, 45 x 55 ft., to the plant of the Oneida Knitting Company, De Pere, Wis., will be erected at once. Some new machinery is said to be required.

An order for 20 railroad motors, each rated at 30 hp., 250 volts, in addition to 30 similar machines in service, has been awarded the Allis-Chalmers Company by the Dolese & Shepard Company, Chicago, for use on its industrial transportation system maintained in connection with their quarries and crushing plants.

Six 30-hp. Wickes boilers, with Detroit automatic stokers, and a cross compound condensing engine of 1500 hp. built at the Nordberg Mfg. Company's works in this city,

will constitute part of the equipment of the King Paper Company's new power plant at Kalamazoo, Mich.

Plans are now practically complete for the new plant of the Gardner Machine Company at Beloit, Wis.

It is currently reported at Superior, Wis., that the Minnesota Steel Company has laid out a long line of coke ovens for erection near the lake front and directly south of Allouez.

The Cleveland-Cliffs Iron Company has started work at the falls of the Autrain River, near Munising, Mich., on a dam which is stated to be the beginning of an extensive hydroelectric power development, the generating station to be located at the foot of the second falls and supplied from the headworks through a steel pipe line of 5 ft. diameter. Hydraulic turbines and governors, generators, exciter units, transformers, switchboard, &c., are given as the machinery requirements of the plant, and an order for this equipment is believed to have been partially placed in Milwaukee and elsewhere.

Pittsburgh Machinery Market.

PITTSBURGH, PA., March 8, 1910.

Trade for the past week has been more than ordinarily active in the coal and lumber districts of Ohio, Pennsylvania, West Virginia and Virginia, where preparations are being quite generally made for production on a larger scale during the latter half of the year. Contracts placed here, either with local concerns or the agents of manufacturers located elsewhere, include machinery in greater variety than the industries mentioned have heretofore required, principally because many of the more important operators having isolated plants have come to the conclusion that it is economy for them to do their own repair work, thereby avoiding costly delays in serious cases of breakdown, and also to better their mechanical facilities for handling material.

Orders from mills, shops, factories, traction lines, railroads, docks, &c., also continue to come in freely and the outlook is bright.

Equipment for a large generating plant will be required by the Consumers' Electric Heating, Light & Power Company, Harrisburg, Pa., if present plans for public service are carried through.

A power station of considerable capacity, equipped with both steam and hydraulic turbines, is reported to be planned by the mining department of the Lehigh Coal & Navigation Company for erection in the vicinity of Broad Mountain, Pa. It is not likely, however, that active work on the proposition will begin before summer, and no machinery has as yet been provided for.

Funds are being provided by the municipality of Big Stone Gap, Va., for the purchase of pumping machinery, tenders of which will be called for in the near future.

A steam power plant of 750 to 1000 hp. maximum capacity will be built by the Stroudsburg & Water Gap Street Railway, Stroudsburg, Pa.

A crushing plant equipped with large gyratory breaker is to be installed by A. J. Haws & Sons, manufacturers of fire brick, at Johnstown, Pa. The principal apparatus has already been contracted for.

The Pennsboro Mfg. Company has been organized at Pennsboro, Pa., to establish a factory for the production of building materials. No equipment details have as yet been given out.

The water works at Greencastle, Pa., will be purchased and enlarged by the municipality, if plans at present formulated are carried out. These call for a new pumping unit.

The Cunard-Lang Company, Columbus, Ohio, is reported to have acquired the location for a new plant to be built before autumn.

The Crescent Machine Company, Leetonia, Ohio, is putting on the market improved types of pattern shop machinery, including a variety woodworker and sliding top saw table.

The Campbell-Brown-Davis Timber Company, recently organized at Huntington, W. Va., is said to contemplate extensive development work in Logan County, W. Va., for which power and cutting machinery and auxiliary equipment will be required.

The construction of municipal water works is under consideration at Crooksville, Ohio.

A report from Canton, Ohio, states that the Wright Wrench Company will build for largely increased capacity.

The plant of the Harold Foundry & Machine Company at New Kensington, Pa., has been acquired by the Pittsburgh Sanitary Mfg. Company, Pittsburgh, Pa., and will be converted into shops for the production of enameled metal, particularly tanks and reservoirs.

A report from Cleveland, Ohio, states that the Hydraulic Press Steel Company of that city will build a new plant, 90 x 245 ft.

In connection with a large mill to be erected near Rowles-

burg, W. Va., from which a 7-mile standard gauge railroad will be constructed to the property, the Glade Lumber Company, recently organized, will build a machine and forge shop, woodworking plant, electric power and lighting station, &c., equipping them with the most modern machinery. J. E. Stitzinger, Woodbine, Va., and A. E. Stitzinger, New Castle, Pa., are among the incorporators of the new concern.

Plans are being drawn for a pumping station to be used for water supply and sewage at Andover, Ohio. The project has not yet, however, reached the point where purchase of equipment will be considered.

Some additional shop facilities will need to be provided this year by the Woods Engineering Company, Alliance, Ohio, although the exact form which these are to take has not been fully determined upon. A large night shift is now being run.

An engine driven generating unit of 250 kw., with exciter, switchboard panels, &c., will be installed within the next few months by the Hyde Park Lumber Company, Cincinnati, Ohio.

From Lima, Ohio, it is reported that the Gramm-Logan Motor Car Company, A. L. White, president, will build a plant there to cost nearly \$500,000, equipped to turn out complete automobiles, with practically every detail manufactured in the company's own shops. The plant at Bowling Green, Ohio, will still be operated.

The Railway Brake Shoe & Mfg. Company, Washington, Pa., notice of whose organization was reported in *The Iron Age* of last week, will erect and operate plants for the production of a composition brake shoe, insulating and roofing material, in Pittsburgh, Pa.; Birmingham, Ala., and Chicago, Ill. The buildings will be of brick, the estimated cost of each, exclusive of equipment, being \$25,000. A general line of foundry supplies will be needed.

Plans have been made for the new buildings to be erected and the additional machinery to be installed at the Greenville, Pa., shops of the Bessemer & Lake Erie Railroad, and which will involve an expenditure of \$250,000 to \$300,000.

Pacific Coast Machinery Market.

SEATTLE, WASH., March 2, 1910.

The conditions noted in last week's report from San Francisco apply with especial emphasis to the cities of the North Coast; but at Portland, Tacoma, Seattle, Spokane and other industrial centers the machinery trade is particularly active in meeting the requirements of sawmills, mines and the extensive power and irrigation projects of the interior districts. Everywhere improvements are in progress and a great deal of development work has been started.

The Sedro Wooley Iron Works, Sedro Wooley, Wash., is adding to its electrical equipment.

Some new machinery has recently been installed in the woodworking plant of the King Sash & Door Company, Penrith, Wash., and more will be required before the season is over.

Plans for a large hydraulic power development to produce electric current for operating mines, pumping plants, &c., are being made by the Commonwealth Power & Water Company, Spokane, Wash. One or more stations with an aggregate capacity of 35,000 to 40,000 hp. will be built, but the details of equipment have not yet been considered.

At Forest Grove, Ore., machinery is to be purchased by the city for a lighting plant of moderate capacity, including an engine driven dynamo.

Several additional alternating current motors of large size are to be provided for the plant of the Salsich Lumber Company, McKenna, Wash., the power for operating which is generated by a steam turbine unit.

Before the year is out, pumping machinery for a municipal water works station of considerable size will probably be contracted for at Santa Barbara, Cal., where important extensions of the present system are now being considered.

Some additional electrical apparatus is likely to be needed during the year by the San Vincente Lumber Company, which is preparing to furnish current for lighting service in the city of Santa Cruz, Cal.

The United Iron Works, Oakland, Cal., is preparing to construct water works for the municipality at Dorris, Cal.

The F. C. Roberts Company, San Francisco, has taken contract for a pumping plant and steel tower at Colusa, Cal.

A municipal power and lighting plant will be provided at Gridley, Cal. The details, however, have not yet been decided upon.

The Eureka Foundry Company, Eureka, Cal., is supplying a number of large timber cutting companies of that section with a new type of heavy steam drag saw having a 4-ft. stroke.

Municipal water works are to be built at Brawley, Cal.

A steam driven hoist is to be purchased by the Orange County Coal Mining Company, Orange, Cal.

A large pump and horizontal turbine wheel for driving it will be installed by the Burbank Power & Water Company, Burbank, Wash.

Two new boilers, engine, dynamo and other machinery are included in improvements to the plant of the Rose Lake Company, Rose Lake, Idaho.

The Northwestern Bridge Company, Tacoma, Wash., has secured the contract for the erection of power plants to cost \$20,000 at Othello, Wash., and the erection of a factory building, 100 x 600 ft., for the American States Products Company. The same contract calls for the erection of two warehouses and a shop building to be erected for the Products Company. The R. S. King Company, represented by Swartz & Britton, Wash., is planning a large number of improvements at Othello, which will result in the immediate development of a manufacturing center, which will represent an investment of about \$250,000.

The Celilo Milling & Power Company, Portland, Ore., recently organized and incorporated with an authorized capital of \$500,000, will erect a plant at Celilo Falls on the Columbia River, about 100 miles from Portland, where it has abundant water power and good shipping facilities. A plant of 10,000 hp. will be erected in the near future, with a view of increasing it to 20,000 hp. The company will also erect a flouring mill of 3000 barrels capacity per day and a woolen mill. None of the machinery for the equipment of this plant has been purchased as yet.

The Seattle-Tacoma Power Company, Tacoma, Wash., is installing equipment to generate 10,000 additional horsepower at its Snoqualmie Falls plant. Approximately \$500,000 will be spent in enlargements this year, and ultimately the present capacity of the plant will be doubled.

Western Machinery Market.

DES MOINES, IOWA, March 7, 1910.

The machinery market of this section, which has been covered to a considerable extent each week by the Chicago report to *The Iron Age*, is assuming an importance which will soon compel closer attention than many manufacturers located east of the river have given it heretofore. In the variety of the demand for equipment of different kinds it is certainly not surpassed by any section of the country. Just at present orders have been placed so far ahead that there is not quite as much activity as was observable immediately after the first of the year, but trade continues on a firm basis and good prices are obtainable. The local plants have all they can do to keep up with the demand made upon them, which in most cases has been taxing their facilities and is leading to foundry and shop extensions. New factories for many purposes are also being put up, and there is general buying of power and pumping units and other apparatus by municipalities, public service corporations and State and local institutions.

W. W. Wertz, Grand Junction, Iowa, will install an electric generating unit this spring for the use of the G. W. Nicholson Light Company.

The Mason City & Clear Lake Railway Company, Mason City, Iowa, whose requirements were stated in *The Iron Age* some months ago, has contracted for two Babcock & Wilcox boilers of the Sterling type, a 200 hp. horizontal turbine and electric generator of the General Electric Company's build, together with current changers and Worthington condensing apparatus.

A new electric generating unit of 500 kw. has been provided for the power plant of the Marshalltown Light, Heat & Railway Company, Marshalltown, Iowa. Some additional equipment will be needed later in the year.

A machine shop 100 x 250 ft. will be added to the works of the Lenox Machine Company, Marshalltown, Iowa. The equipment details have not yet been fully determined upon.

Extensive improvements will be made in the division terminals of the Chicago & Northwestern Railway at Hawarden, Iowa—a new roundhouse, large turntable, coal handling apparatus, pump and repair tools.

The plant of the Petersen Heat, Light & Water Company, Marshalltown, Iowa, which is reported to have passed under the control of St. Louis capitalists, will be enlarged in capacity, and other power stations may be built during the year. Machinery requirements have not been determined upon, as far as can be learned.

Auxiliary pumps will be installed in the local public service station at Ames, Iowa.

The Shaver Carriage Company, Des Moines, Iowa, has decided to enter upon the manufacture of automobiles and will erect a large addition to its plant in East Des Moines for that purpose.

The municipal authorities at Trenton, Mo., have engaged an engineering firm to prepare plans for the proposed electric power and pumping station.

The Union Sand & Material Company, St. Louis, Mo., is arranging to install a large stone and gravel crusher, together with auxiliary apparatus.

A boiler, automatic, high speed engine, dynamo and air compressor are required by O. F. Warren, Easton, Mo.

The American Stove Company is reported to have decided upon the erection of a new plant at St. Louis, Mo., to cost \$500,000. It will be electrically operated throughout, except where pneumatic appliances are needed.

Improvements of the water works system, with installation of some new machinery, will probably be undertaken this summer by the city of Columbus, Neb.

An electric power and lighting station for municipal service is to be built this spring at Elm Creek, Neb. The machinery has not yet been contracted for.

Adams & Kelley, Omaha, Neb., will build a large addition to their plant.

From Denver, Colo., it is reported that the Denver Rock Drill & Machine Company will put up an extensive plant for the manufacture of mining equipments.

The C. A. Dunham Company and the National Vacuum Heating Company, Marshalltown, Iowa, have foundations in for three factory buildings, to be erected at a cost of \$30,000. The buildings under construction are a main factory building, 40 x 80 ft., two stories; power house, 36 x 40 ft., and an office building, 48 x 54 ft. The power house will be arranged with overhead coal bunkers, two boilers, automatic stokers and high speed engines, directly connected with dynamos. It is estimated that the entire plant as planned will represent an investment of \$65,000.

The Puritan Ice Company, Muscatine, Iowa, has awarded a contract to Wm. Kincaid, contractor, of that city, for the construction of an ice plant. Equipment of the latest improved type will be installed and it is hoped to have the building sufficiently advanced to begin installing the machinery in four or five weeks.

Ferguson Brothers, Waterloo, Iowa, will erect in the rear of their present quarters a large storehouse. The building will be constructed of concrete and will be large enough to store several hundred machines and a large amount of material and will greatly facilitate the handling of material for well drills and other machinery. An addition to the machine shop will also be erected, increasing the amount of floor space for the installation of new machines. New equipment to be installed will consist of three new lathes, several drill presses, a shaper, a bushing boring machine and a large circular steel cutting saw. Work on these improvements will be commenced as soon as the weather will permit.

Plans are under way at Ward, Colo., for the construction of a hydroelectric plant there by the Audubon Power Company.

The municipality at Montrose, Colo., will probably acquire and enlarge the local lighting plant, with consequent need of some new electric generating and transforming apparatus.

Auxiliary centrifugal pumping units, gasoline engine or electric motor driven, for raising the pressure in some of the distribution mains, will be required before long by the Water Department at Trinidad, Colo.

The Commonwealth Power & Electric Company, Georgetown, Colo., has had plans drawn for a hydroelectric power station of 7000-kw. or more on the Grand River. The construction details are now being worked out, and the matter of turbines, governors, generators, power transmission, &c., will be taken up later.

The installation of a system of water works has been officially determined upon at Worland, Wyo.

Preliminary plans for a system of water works are under discussion at Willard, Utah, where an engineer will be engaged to make the necessary survey and estimate of the cost.

Plans involving the purchase of hydraulic turbines, generators, transformers, control apparatus and other electrical equipment are reported to be under consideration by the Idaho Power & Transmission Company, Idaho Falls, Idaho. Details will, however, not be made public for some time to come.

The installation of water works owned by the community is being advocated at Midvale, Idaho.

Construction of a hydroelectric plant of 1000 kw. on the Snake River is under consideration by the city of Idaho Falls, Idaho.

Detroit Machinery Market.

DETROIT, MICH., March 8, 1910.

A trip down into Indiana and back through western Ohio gives evidence that the conditions recently mentioned in this report as prevalent in Michigan obtain in those sections also, although some manufacturers stated that just prior to the beginning of March, trade fell off somewhat and has not picked up again to the extent that they hoped. Orders in hand, however, are sufficient to keep them all busy for some time to come, and there is no apprehension of any settled dullness.

Wickes Bros., Saginaw, Mich., are distributing their monthly stock list. The trade of this concern in power equipment and shop machinery continues large.

The Watervliet Paper Company, Watervliet, Mich., has

purchased three 200-hp. Wickes boilers, vertical type, and three Detroit stokers.

W. C. Hopson, Grand Rapids, Mich., is having plans prepared for a new factory building to be erected at an estimated cost of \$35,000.

Considerable new machinery will be required within the year for municipal power and lighting service at Kalamazoo, Mich., where various projects for increasing the capacity of the present plant are now being considered. An entirely new generating station may be built.

The Business Men's Association of Wyandotte, Mich., is said to have received assurances that the Swift Automobile Company will build a large plant there for the manufacture of motor cars and industrial trucks. No details as to capacity or equipment are mentioned.

Several steam boilers, three Corliss engines, six beater engines and a paper machine will be required for the new plant which the Babcock Tissue Paper Company has decided to erect at Otsego, Mich.

The Austin Automobile Company, Grand Rapids, Mich., is reported to be negotiating with commercial interests in Waukegan, Ill., on the basis of locating a factory there.

New machinery, including power equipment, will be needed for three factory buildings which are to be erected at Grand Rapids, Mich., by the Eagle Tanning Company, for a plant to be used in the production of leather for automobile seats.

An electric generating set, consisting of a steam turbine direct coupled to an alternating current dynamo, together with boilers, pumps, condenser, &c., are to be installed in the plant of the Ford Plate Glass Company, Toledo, Ohio.

W. R. Harrison & Co., Massillon, Ohio, have decided upon a large addition to their plant, for which power and wood working machinery will be required.

The St. Clair Electric Light & Water Works Company, St. Clair, Mich., is about to put in service a new generating unit of 250 hp. Some auxiliary equipment may be needed later.

The Bockstege Furniture Company, Evansville, Ind., is building an addition to its factory.

A large increase will be made this season, with consequent need of new equipment, in the manufacturing facilities of the Hercules Buggy Company, Evansville, Ind.

The M. Rumley Company, La Porte, Ind., has a new foundry under construction.

An engine and dynamo, motors, grinders, conveyors, &c., will be required for a new fertilizer plant which E. Rauh & Son are to build in Indianapolis, Ind.

A Corliss engine of about 500 hp., for belting to line shafting, will be installed in the power plant of the United States Powder Company, Terre Haute, Ind.

The Great Western Mfg. Company, La Porte, Ind., will erect a new factory, 50 x 200 ft., equipped for the production of metal stampings to be used in various industries.

The new plant which the Pullman Motor Car Company, York, Pa., is planning to build at Evansville, Ind., will be furnished with machinery for a greater capacity than that of the home factory. The full list of tools has not been made out.

The Regal Motor Car Company, Detroit, Mich., has purchased a block of land, 485 x 500 ft., between St. Antoine and Hastings streets, in that city, and is preparing plans for the erection of several buildings for the extension of its factory.

The Swift Automobile Company, 1120 Chamber of Commerce Building, Detroit, Mich., is having plans prepared for a factory building, 60 x 300 ft., which it will erect at Wyandotte, Mich., on a site granted the company by the council of that city. W. R. Beattie is general manager of the company.

The Beyster Motor Truck Company, Detroit, Mich., has been reorganized and is preparing plans for two factory buildings which will represent an outlay of \$200,000. The new officers of the company are: D. M. Newbro, president; Benson E. Brown, vice-president and sales manager; E. E. Gallogly, treasurer; Edgar E. Murray, secretary and general manager.

The Michigan Motor Car Company, capitalized at \$1,000,000, was recently organized at Detroit for the purpose of manufacturing automobiles. H. M. Thomas is trustee and principal stockholder of the company.

The Kalamazoo Motor Company, Kalamazoo, Mich., recently incorporated with capital stock of \$15,000, will build a garage.

The Puritan Electric Heater Company, 51-55 Tenth street, Detroit, Mich., mentioned in *The Iron Age* of February 24 as the Auto Parts Mfg. Company, has erected a new plant and is in the market for motors and ironworking machinery.

The World's Star Knitting Company, Bay City, Mich., is contemplating the erection of a new mill and the installation of machinery driven by individual motors, for which a 125-hp. engine and a new generator will be required.

The Anderson Forge & Machine Company, Detroit, Mich., will enlarge its plant and install new hammers, presses and machine tools. It is understood that orders for the new equipment will soon be placed.

Northwestern Machinery Market.

MINNEAPOLIS, MINN., March 7, 1910.

Reports in relation to the demand for machinery through this section of the country and west to the Coast are somewhat at variance, according to the nature of the equipment discussed, but while there has been an appreciable slackness lately in certain lines, trade in general holds up very well. Apparatus of general utility, including power and pumping units, sells the most readily, and it is difficult to get any guarantees of early delivery, although some salesmen are ready to make unsupported promises.

Among the notable power plant installations now being made is one of three steam turbines and generators in a new station for the distribution of electrical energy to mills at Virginia, Minn., by the Virginia & Rainy Lake Company. This is being observed with a great deal of interest by iron mine operators on the ranges, and its successful operation will lead to other similar installations.

Plans will be drawn at some time within the next few months for a large power plant to be erected at or near Gilbert, Minn., to furnish electric current for operating the projected Mesaba Traction Company. W. D. Chapman, Chicago, is reported to have been engaged as engineer. His office is in the Marquette Building.

Boilers and a Corliss engine, with possibly a generator and electric motors, will be required for a new factory which the Manchester Biscuit Company of Sioux Falls, S. D., is to erect at Fargo, N. D.

One of the largest plants in the Northwest, with power and timber cutting machinery, conveyors, transmitting apparatus, &c., will be built at a cost of \$300,000 at St. Maries, Idaho, by a company which Asa V. Bradrick, Spokane, Wash., has organized.

A tubular boiler of about 250 hp. will be required for the plant of the South St. Paul Electric Light, Heat & Power Company, South St. Paul, Minn., upon the completion of a contemplated addition.

The construction of a pumping plant and water works system is being planned at Deering, N. D.

Tenders will be taken about April 10 for the erection and equipment of an electric power and lighting station to be operated by the city of Lewiston, Mont.

An engine driven dynamo of about 100 kw. capacity or over will probably be bought this spring at Fairfax, Minn., for municipal service. The purchase has not yet, however, been fully authorized.

The Great Northern Power Company, Duluth, Minn., is preparing to largely extend its commercial load during the present year.

A hydraulic turbine and electric generator of large capacity will be added to the power equipment of the Northwestern Consolidated Mill Company, Minneapolis.

About 12 motors for machinery drive, comprising nearly 500 hp. in aggregate capacity, will be required for a new mill to be erected at or near Minneapolis by the Nelson Paper Co. of this city. For particulars address the company direct. Other machinery is also said to be needed.

A 200-ton gypsum plant, with power and operating machinery, will be built at Black Hawk, S. D., by the Dakota Plaster Company.

The contract for 2000 tons of cast iron pipe needed at Duluth, Minn., has been awarded by that city to the United States Iron Pipe & Foundry Company.

Plans for the new municipal power and lighting station at Tyndall, S. D., previously referred to in *The Iron Age*, have been prepared by Oscar Claussen, St. Paul, Minn. They include a gas producer and gas engine power plant and a motor driven pump to be used in increasing the capacity of the water works.

The Minneapolis Steel & Machinery Company, Minneapolis, is at work on material for a large cement plant to be built in Montana.

The Peerless Traction Engine Company, Minneapolis, has been succeeded by a company known as the Pioneer Tractor Mfg. Company, which is planning to build a new plant in Winona, Minn. Should this be done considerable additional equipment will undoubtedly be needed.

The State of Minnesota has prepared plans for the erection of a new penitentiary at Oak Point, about two miles from the business center of Stillwater. For the erection, equipment and general preparation for the prison the State Board of Control received from the Legislature \$2,250,000. About \$298,000 of this amount will be used for the erection and equipment of the farm machinery buildings. The mechanical features of the plans include a central power and heating plant, water mains and sewers, electrical distribution system for light and power, electric light and power wiring of the buildings, plumbing, ventilating, sprinkler system, electrical elevators, electric motor drives for all machinery, dust collectors for the factory section, laundry machinery, kitchen apparatus with ovens, refrigerating plant and cold storage. Three turbine engines, with a total of 1175 hp., will be installed. These engines will be lubricated by an electrically driven oil pump, as will all machinery and

apparatus to be installed at the institution. Motors will be used for operating all machinery in the factory and other apparatus to be installed.

Southwestern Machinery Market.

KANSAS CITY, Mo., March 7, 1910.

The machinery trade throughout the Southwest remains steady. No large orders for machine tools or other metal working equipment are in prospect, except apparatus intended for railroad shops, which will be principally purchased in the East, but a good many single tools or small lines of tools for use in what may be termed local plants doing business within a limited radius of territory will be needed within the next few months. Opportunities for the larger sales in this section have, probably without exception, been specifically referred to by *The Iron Age* since the revival of business began, and competition for such contracts has been spirited, but the smaller trade is as a whole much more worth going after and yields better profits, both to manufacturers and dealers. The bulk of the orders now being placed is, however, for power and pumping machinery, contractors' equipment and apparatus of general utility, as indicated in the following items:

A Corliss engine of about 300 hp. for belting to line shaft will be installed in the late spring by the Goodlander Mfg. Company, Fort Scott, Kan. This and auxiliary equipment is stated locally to have been already purchased.

B. F. Nickerson & Co., Shawnee, Okla., are providing equipment for a cement products plant of moderate capacity.

The Dixie Motor Car Company, recently mentioned in *The Iron Age*, is proceeding with the plans for its new factory at Frederick, Okla., which it expects to have in operation about June 15. Some if not all of the machinery remains to be purchased.

A pumping plant is to be installed in the near future by the De Ridder Water Works Company, De Ridder, La.

R. H. Johnson, Beaumont, Texas, is establishing a wood-working shop there. The equipment has been provided.

T. L. Deisch, Helena, Ark., is reported to be in the market for an electric generating unit to be installed at Elgin, Texas, although he may utilize machinery which has been in service elsewhere.

An engineer will probably be engaged shortly by the city of Anson, Texas, to draw plans for a pumping plant and water works system, including steel storage tank, as both domestic and fire service are urgently required.

A. B. Richardson, Childress, Texas, is providing machinery for a new factory there. Cutting and sewing machines and power equipment are among the requirements of the plant.

A power house having 1200-hp. capacity is being equipped by the Monarch Portland Cement Company, Humboldt, Kan., for its new works. Eight huge rotary kilns, with tube mills, pulverizers, coolers, motors, &c., will be installed in the latter.

An engine, generator and refrigerating machinery will be installed by the McAllen Ice & Power Company, McAllen, Texas.

The Midland Water Works & Power Company, Midland, Texas, is planning the construction of an electric generating plant. Machinery requirements have not yet been fully determined upon.

A pumping plant for water supply and fire protection will probably be built before fall at Hollis, Okla. No definite plans, however, are in readiness.

An electric power and lighting unit is to be installed by the Forney Electric Light & Ice Company, Forney, Texas.

The building of water works, with gas engine driven centrifugal pumps, is under consideration at Rosenberg, Texas.

Electric dynamos and prime movers, together with auxiliary equipment, will be required shortly by the Eureka Springs Electric Company, Eureka Springs, Ark., for a new plant.

A machine shop for repair work is to be operated in addition to its mercantile business by the Gourney Hardware Company, recently organized at Eunice, La.

A belted generator of 175 to 200 kw. for alternating current, with exciter, switchboard, transformers, &c., will be installed by the York Lumber Company, Vaundale, Ark., to light the plant and furnish current for operating induction motors to drive the machinery. About 12 motors are also being provided for. The contract is understood locally to have just been placed.

From Dallas, Texas, it is reported that the Coco Cola Company, Atlanta, Ga., will build a large factory there.

An electric generating unit of 100 hp., with auxiliary machinery, is required by the Ennis Light & Power Company, Ennis, Texas.

The new plant of the Allen Water Company, Allen, Texas, recently mentioned in *The Iron Age*, will be electrically operated, motor driven centrifugal pumps having been decided upon.

One or more new shops are to be erected and equipped

with modern tools by the N. S. Sherman Machinery Company, Oklahoma City, Okla.

The El Paso Foundry & Machine Company, El Paso, Texas, has been appointed agent for the John A. Roebling Sons Company, Trenton, N. J., in the sale of wire rope and cables.

The machinery for the new municipal power plant at Terrell, Texas, whose requirements were mentioned in *The Iron Age* some months ago, is now being installed. It consists of an additional engine, generator and auxiliary apparatus.

If successful in securing water from wells now being sunk, the Chemung Copper Company, Silver City, N. M., will install a pumping plant sufficient to serve a 100-ton mill.

Some electrical equipment will need to be purchased during the year by the Rio Lucero Power Company, Santa Fé, N. M., which is planning an extensive system of power transmission.

The Mildred Mining & Milling Company, Dan B. Genung, general manager, will be in the market before long for hoisting and pumping machinery to be installed at Stanton, Ariz. A 35-ton mill is also to be built on its property there, according to a report from Prescott, Ariz.

Equipment for mining and ore reduction is to be purchased this summer by the Mountainair Mining Company, Mountainair, N. M. P. W. Hoshor is president and manager.

H. G. Landis, Wichita, Kan., has established an electrical elevator company in that city for the manufacture of passenger and freight elevators and hoisting machinery of various kinds. The company has secured the building formerly occupied by the Western Newspaper Union, which it is equipping with machinery for the manufacture of its product. It has made application for a State charter and will be incorporated at \$10,000.

The Brady Water & Light Company, Brady, Texas, which for some time has been developing wells at that place, advises that it will install a 20-ton ice plant as soon as satisfactory water can be found. The company is now ready to contract for a 150,000-gal. elevated steel tank, 250,000 lb. of 4, 6 and 8 in. cast iron pipe, and a gasoline or gas engine for its light plant.

The Cudahy Packing Company, Wichita, Kan., will commence work on improvements to its plant within a few days which will necessitate the expenditure of approximately \$300,000. Plans for the new buildings, which will be modern and sanitary, have been accepted, both by the Government at Washington and the packing company.

The Phoenix Iron & Steel Company, New Orleans, La., is opening up a scrap yard at Galveston, Texas, where scrap of all kinds will be cut up and sheared for exportation. Conveying equipment for handling scrap will also be installed.

The Orange Garage & Gasoline Engine Company, A. L. Mitchell, manager, Orange, Texas, has established an automobile garage and gas engine shop at that point. It is in the market for a lathe, shaper and power hack saw. The balance of its equipment has been purchased.

J. W. Day, Fort Worth, Texas, will construct an electric light and ice plant at Grapevine, Texas. It is understood that most of the equipment has been purchased.

Southern Machinery Market.

NASHVILLE, TENN., March 7, 1910.

During the past week local manufacturing plants in this section, as well as representatives of Northern machinery builders, have experienced a fair trade, but the greatest amount of effort at present seems to be devoted to fulfilling deliveries promised some time ago, as purchasers are, in nearly all cases, anxious to get new equipment installed. Boiler and repair shops have been particularly rushed with orders marked "urgent," and there does not appear to be any let-up in prospect. Engine builders and dealers in power machinery, belting, shafting pulleys, &c., as well as electrical contractors, are also hurried by anxious buyers, who want to get their plants in good running condition or providing for operating extensions. Among new purchasers the lumber and mining companies and municipalities predominate, with working plants next in line.

The establishment of a pumping plant for municipal service is being planned at Hartsell, Ala.

A permanent saw milling plant, which is one of the best constructed in the United States, being of steel and concrete, has been put in operation by the Hebbard Cypress Company at Waycross, Ga. It is electrically driven throughout. This marks or rather emphasizes the beginning of a new era in Southern mill building, which is now fully equal to the best Northern standards. Fabricated iron and steel will hereafter play a prominent part in such construction, thereby widening the Southern market for those products.

Water works will probably be provided this year at Newport, Tenn., where the matter is now under consideration.

Some new equipment may be required before long for the municipal pumping station at Eastman, Ga.

A motor driven centrifugal pump with 8-in. discharge will be required for the power plant of the Memphis Consolidated Gas & Electric Company, Memphis, Tenn.

Power, cutting and wood working machinery will be required for a new mill which the Moffet, Bowman & Rush Company, Memphis, Tenn., will erect at South Memphis. The main office of this concern is at Madison, Ind.

Some power transmitting apparatus is required by the Greenfield Electric Light & Water Company, Greenfield, Tenn.

Two new boilers and a Corliss engine of 150 hp. are to be installed in the power plant of the General Lumber Company, at Ashland, Ky. This equipment has already been contracted for.

The Maddox Foundry & Machine Company, Archer, Fla., will erect a 40 x 118 ft. addition to its machine shop and a 30 x 40 ft. addition each to its pattern and blacksmith shops. It is reported to be in the market for considerable equipment for these additions.

The Georgia, Southern & Florida Railway Company, J. B. Munson, vice-president, Macon, Ga., has purchased 14 acres of land at Valdosta, Ga., on which will be erected car repair shops to cost about \$40,000. It is understood that a roundhouse will be built later.

Mexican Notes.

La Cia, Manufacturera de Cemento Portland, Dublan, Hidalgo, Mexico, will install a number of alternating current motors in its plant. The machinery is to be purchased in the United States.

The St. Louis-Oaxaca Iron & Steel Company, Oaxaca, Oax., Mexico, has been organized to develop extensive iron deposits in southern Mexico and operate what is known as the Divina Providencia iron working plant. The address of the managing director, A. K. Stewart, is given as St. Louis, Mo.

Concentrating machinery, including a grinding and amalgamating mill of the Huntington type, will be installed by the Santa Rosa Mining & Milling Company at Ayuta, near Guadaljara, Mexico.

The Tajo de Delores Company, Guanajuato, Mexico, for which Weed & Probert, Los Angeles, Cal., are engineers, will purchase grinding, pulverizing and concentrating machinery shortly.

Government Purchases.

WASHINGTON, D. C., March 8, 1910.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids March 22 for one steam drop hammer, schedule 2303, and on March 29 for one No. 2 milling machine, schedule 2325.

Bids will be received by the Bureau of Navigation, Navy Department, Washington, until April 6, for a refrigerating and ice making plant at the Naval Training Station, Great Lakes, North Chicago, Ill. R. F. Nicholson, chief of bureau.

The Isthmian Canal Commission opened bids February 28 for the following:

Class 1.—Two 175-hp. boilers—Bidder 2, Babcock & Wilcox Company, New York, \$11,500; 4, The Charles Barnes Company, Cincinnati, Ohio, \$10,427; 10, Casey & Hedges Company, Chattanooga, Tenn., \$63,000; 14, P. Delaney & Co., Newburgh, N. Y., \$10,660; 18, Dover Boiler Works, Dover, N. J., \$8930; 25, Harlin & Hollingsworth, Wilmington, Del., \$10,338; 27, E. Keeler Company, Williamsport, Pa., \$8350; 30, Manning, Maxwell & Moore, New York, \$10,100 and \$7832; 36, Oil City Boiler Works, New York, \$9100; 40, Phoenix Iron Works Company, Meadville, Pa., \$7600; 53, Vermilye & Power, New York, \$9280.

Class 2.—One double suction centrifugal pump—Bidder 7, Blackall & Baldwin Company, New York, \$3423; 9, Buffalo Steam Pump Company, Buffalo, N. Y., \$2677; 19, Dravo-Doyle Company, Pittsburgh, Pa., \$3230; 22, Fox Brothers & Co., New York, \$3773.49; 30, Manning, Maxwell & Moore, New York, \$2475 and \$2940; 34, Motley, Green & Co., New York, \$2887.75; 41, Platt Iron Works Company, Dayton, Ohio, \$2904; 53, Vermilye & Power, New York, \$2615.50; 58, R. D. Wood Company, Camden, N. J., \$2100; 59, Henry R. Worthington, New York, \$1912.

Class 3.—Two vertical feed pumps—Bidder 5, Berry & Aikens, Philadelphia, Pa., \$520; 9, Buffalo Steam Pump Company, Buffalo, \$175; 17, H. C. Dodson, Norfolk, Va., \$326.66; 21, Fairbanks, Morse Company, Chicago, Ill., \$330; 22, Fox Brothers & Co., New York, \$332.88; 30, Manning, Maxwell & Moore, New York, \$400; 34, Motley, Green & Co., New York, \$404.60; 41, Platt Iron Works Company, Dayton, Ohio, \$390; 47, Scranton Steam Pump Company, Scranton, Pa., \$387.20; 53, Vermilye & Power, New York, \$399.50; 57, Francis T. Witte Hardware Company, New York, \$420; 59, Henry R. Worthington, New York, \$257.50.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids March 1 for the following:

Class 41.—One complete screw cutting back geared tool lathe—Bidder 10, Bradford Machine Tool Company, Cincinnati, Ohio, \$895; 66, Frevert Machinery Company, New York, \$870 and \$733; 84, Hendy Machine Company, Torrington, Conn., \$1070; 94, J. B. Kemp, Baltimore, Md., \$1062, \$1012.96 and \$968.50; 113, Manning, Maxwell & Moore, New York, \$925, \$952 and \$782; 126, Niles-Bement-Pond Company, New York, \$899; 136, Prentiss Tool & Supply Company, New York, \$819 and \$793; 215, Cincinnati Lathe & Tool Company, Cincinnati, Ohio, \$868 and \$701.

Class 141.—Two marine water tube boilers—Bidder 5, Almy Water Tube Boiler Company, Providence, R. I., \$4453; 146, Robert Safety Water Tube Boiler Company, Red Bank, N. J., \$3980; 201, Charles Ward Engineering Works, Charleston, W. Va., \$5970.

Iron and Industrial Stocks.

NEW YORK, March 9, 1910.

Stock values have steadily risen under the influence of more cheerful reports regarding general business, excellent railroad earnings and the absence of unfavorable rumors from Washington. The United States Steel stocks were among the strongest on the list. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	12 - 12%	Railway Spr., pref.	.... 105
Allis-Chalm., pref.	43 - 45	Republic, com.	39% - 41%
Beth. Steel, com.	30% - 31%	Republic, pref.	102% - 104
Beth. Steel, pref.	60 - 64	South. I. & S., com.	21% - 22
Can., com.	12% - 12%	South. I. & S., pref.	45 - 48
Can., pref.	77% - 79%	Sloss, com.	77% - 84
Car & Fdry., com.	65 - 68	Sloss, pref.	118 - 119
Car & Fdry., pref.	118% - 119	Pipe, com.	25% - 26%
Steel Foundries,	60% - 64	Pipe, pref.	78
Colorado Fuel.	41% - 43%	U. S. Steel, com.	84% - 89%
General Electric.	155 - 157%	U. S. Steel, pref.	120% - 122%
Gr. N. ore cert.	70 - 71%	Westinghouse El.	73% - 75%
Int. Harv., com.	93 - 95	Am. Ship. com.	75
Int. Harv., pref.	122 - 122%	Chi. Pneu. Tool.	44 - 46%
Int. Pump, com.	48 - 49	Cambridge Steel.	48% - 49%
Int. Pump, pref.	86% - 88	Lake Sup. Corp.	24 - 24%
Locomotive, com.	53% - 55%	Pa. Steel, pref.	.... 112%
Locomotive, pref.	112 - 113%	Warwick	11 - 11%
Nat. En. & St., com.	23% - 24	Crucible Steel, com.	15% - 16%
Pressed St., com.	44% - 47	Crucible St., pref.	89% - 92
Pressed St., pref.	102 - 103	Harb.-W. Ref., pref.	.... 93
Railway Spr., com.	44 - 45%		

Last transactions up to 1 p.m. to-day are reported at the following prices: United States Steel common 89%, preferred 122%; bonds 105%; Car & Foundry common 67%, preferred 119%; Locomotive common 55%, preferred 113%; Colorado Fuel 43%; Pressed Steel common 46%; Republic common 41%, preferred 104%; Sloss-Sheffield common 82%; Cast Iron Pipe common 26%, preferred 77%; Can common 12%, preferred 79.

A special meeting of the Southern Iron & Steel Company stockholders has been called for March 14, to authorize the increase of \$1,000,000 in preferred stock. The rights on the shares will be divided pro rata among holders of preferred and common stocks, but notice of desire to purchase must be given by March 14. The directors have authorized the issue of \$1,200,000 6 per cent. 5-year convertible gold debentures, convertible into preferred stock at \$70 a share.

The Pittsburgh Coal Company's report for the year ending December 31, 1909, shows a profit, after all expenses, of \$3,448,395, against \$3,024,921 for the previous year. After allowances for depreciation, interest, &c., a balance of \$810,098 was carried to surplus, making the total surplus \$7,831,333. No dividends were paid during the year, but one was declared on the preferred stock in January. Dividends had accrued on the preferred stock from March, 1905.

The American Steel Foundries has issued a report for the six months ended January 31, 1910, which gives the following income account: Earnings from operation of plants and net income of subsidiary companies (after deducting expenses), \$702,794; other income, \$21,112; total income, \$723,906; interest, sinking fund and depreciation, \$407,862; net income, \$316,044.

Dividends.—The General Motors Company has declared a dividend of 3½ per cent. on the preferred stock, payable April 1.

The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

The Union Switch & Signal Company has declared a dividend of 3 per cent. on both the common and preferred stocks.

Trade Publications.

Fuel Economizers.—The Green Fuel Economizer Company, Matteawan, N. Y. Folder. Describes a number of installations in textile mills where large savings have resulted, and the actual amount is figured out for one of the plants.

Machine Tools.—The Burke Machinery Company, Conneaut, Ohio. Catalogue. Illustrations and descriptive matter explain the operation of a line of machine tools that includes milling machines and attachments, index centers, slotting attachments, arbors, vises, cutting-off saws, saw grinders, sensitive drill presses, tapping machines and hand shapers. A coal oil forge, designed to meet the requirements of all-round machine shop practice, and a hydraulic pressure pump, specially designed to pump water for testing valves, are also illustrated.

Steam Traps.—Morehead Mfg. Company, Department 9, Detroit, Mich. Mailing card. Deals with the advantages of installing the Morehead return and nonreturn steam traps for draining condensers, engine receivers, separators, steam mains and other power plant equipment. The return type of trap, it is stated, collects all the water of condensation and automatically returns it to the boilers as pure, hot feed water, thus doing away with the use of a steam pump to feed the boiler. The reverse of the card has an illustration of the interior of

the Western Electric Company's power plant at Hawthorne, Ill., where these traps have been installed.

Metal Drilling and Sawing Machines.—Hoefer Mfg. Company, Freeport, Ill. Catalogue P, 6 x 9 in., 56 pages. This is the company's 1910 catalogue describing and illustrating a line of drill presses, power metal saws, horizontal drilling and boring machines and vertical boring machines. The drills shown range from light friction and belt driven bench drills for jewelry, electrical and model work to the 36-in. sliding head drill with geared power feed. The application of electric motor drive to these tools is shown and space is devoted to vertical and horizontal drilling and boring machines and one which is a combination of both types, the power hack saw made in two sizes and arranged to lift automatically from the work and stop as soon as the cut is finished, and the two-spindle cylinder boring machine, described in *The Iron Age* September 30, 1909.

Ignition Systems and Supplies.—Pettingell-Andrews Company, Pearl street and Atlantic avenue, Boston, Mass., and Philadelphia Timer & Machine Company, Philadelphia, Pa. Joint catalogue and circulars. Catalogue R 2 pertains to the Velos line of ignition devices manufactured by the latter company and sold through the former, who is its exclusive selling agent. The line includes timers, distributors and igniters for all sizes and types of gas and gasoline engines. The circulars describe and illustrate the Velos mono-arc high tension, jump spark, make-and-break ignition system and the distributor employed. As the name implies the distributor gives one spark for each impulse of the motor, and in this way, it is stated, the highest efficiency of the spark, as well as the greatest economy of current, is secured.

Interchangeable Case Dies.—The National Machinery Company, Tiffin, Ohio. Pamphlet. Describes the new National interchangeable case die. The case of this die is made of a special grade of steel and is designed to form a perfect seat for the chaser and eliminate lost motion. The chaser will interchange from one case of a given size head to another, and extends the full width of the case. The advantages of the wide chaser are a greater number of resharpenings and more bearing on the work, which insures the maintenance of correct pitch. The illustrations show the die at work and the proper methods of grinding.

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CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—

Refined Iron:	
1 to 1½ in round and square.....	\$ 1.90¢
1½ to 4 in x ¾ to 1 in.....	2.10¢
1½ to 4 in x ¼ to 5-16.....	2.10¢
Rods—½ and 11-16 round and square.....	2.10¢
Angles:	
3 in x 1½ in and larger.....	2.10¢
3 in x 3 in and ½ in.....	2.35¢
1½ to 2½ in x ½ in.....	2.35¢
½ to 2½ in x 3-16 in and thicker.....	2.10¢
1 to 1½ in x 3-16 in.....	2.20¢
1 to 1½ in x ½ in.....	2.20¢
2½ x ½ in.....	2.50¢
½ x ½ in.....	2.50¢
½ x 32 in.....	4.85¢
Tees:	
1 in.....	2.65¢
1½ in.....	2.45¢
1½ to 2½ x ½ in.....	2.15¢
½ to 2½ in x 3-16 in.....	2.35¢
3 in. and larger.....	2.10¢
Beams:	
Chamfer—3 in. and larger.....	2.10¢
Hand—1½ to 6 x 3-16 to No. 8.....	2.10¢
"Burden's Best" Iron, base price.....	2.10¢
Burden's "H. B. & S." Iron, base price.....	2.10¢
Norway Bars.....	2.80¢

Merchant Steel from Store—

Bessemer Machinery.....	per lb
Toe Calk, Tire and Sleigh Shoe.....	2.50¢ to 8.00¢
Best Cast Steel, base price in small lots.....	7¢

Sheets from Store—

Black	
One Pass, C.R. Soft Steel.....	R G Cleaned.
No. 16.....	\$ 2.90¢
Nos. 18 to 21.....	2.95¢
Nos. 22 and 24.....	3.05¢
No. 26.....	3.10¢
No. 28.....	3.20¢

Russia, Planished, &c.	
Genuine Russia, according to assort-ment.....	P D 12 @14%
Patent Planished, W. Dewees Wood.....	P D A, 10¢; B, 9¢ net.

Galvanized.

Nos. 11 to 16.....	P D 3.20¢
Nos. 22 to 24.....	3.35¢
No. 26.....	3.75¢
No. 28.....	4.10¢
No. 20 and lighter 36 inches wide, 25¢ higher.	

Genuine Iron Sheets—

Galvanized.	
Nos. 22 and 24.....	P D .5.13¢
No. 26.....	6.25¢
No. 28.....	7.25¢

Corrugated Roofing—			
2½ in. corrugated.	Painted	Galvd.	
No. 24.....	\$ 3.85	4.40	
No. 26.....	2.95	4.00	
No. 28.....	2.60	3.75	

Tin Plates—			
American Charcoal Plates (per box.)			
“A.A.A.” Charcoal:			
IC, 14 x 20.....	.85	.55	
IX, 14 x 22.....	1.70		
A. Charcoal:			
IC, 14 x 20.....	.85	.40	
IX, 14 x 20.....	.85		
American Coke Plates—Bessemer:			
IC, 14 x 20.....	1.07	.84	
IX, 14 x 20.....	1.40		

American Terne Plates—			
IC, 20 x 28 with an 8 lb. coating.....	.88	.80	
IX, 20 x 28 with an 8 lb. coating.....	1.05		

Bolts—			
Common Carriage (cut thread):			
36 x 6 and smaller.....	.70	.75	
Larger and longer.....	.65		
Common Carriage (rolled thread):			
36 x 6, smaller and shorter.....	.70	.75	
Phila. Eagle, \$3.00 list.....	.90	.80	10% off
Bolt ends w/ C. & T. Nuts.....	.65		
Machine (Cut Thread):			
36 x 4 and smaller.....	.70	.75	
Larger and longer.....	.65	.70	

Nuts			
Blank or Tapped.			
Cold Punched:	Off List.		
Square.....	.40	.40	
Hexagon.....	.50	.50	
Square, C. T. & R.....	.50	.50	
Hexagon, C. T. & R.....	.60	.60	
Hot Pressed:	Off List.		
Square.....	.50	.50	
Hexagon.....	.50	.50	

Seamless Brass Tubes—			
List November 13, 1908.	Base price	18¢	

Brass Tubes, Iron Pipe Sizes—			
List November 13, 1908.	Base price	18¢	

Copper Tubes—			
List November 13, 1908.	Base price	22¢	

Brazed Brass Tubes—			
List August 1, 1908.	20½¢	P D	

High Brass Rods—			
List August 1, 1908.	15½¢	P D	

Roll and Sheet Brass—			
List August 1, 1908.	15½¢	P D	

Brass Wire—			
List August 1, 1908.	15½¢	P D	

Copper Wire—			
Base Price.	Carload lots mili 15¢		

METALS—

Tin—

Straits Pig.....	P D 37½¢
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Copper—

Lake Ingot.....	P D 14½¢
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Electrolytic.....	P D 14½¢
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Casting.....	P D 14½¢
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Sheet Copper Hot Rolled, 16 oz (quantity lots) P D advance over Hot Rolled.

Sheet Copper Polished 20 in wide and under, 16 P square foot
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Sheet Copper Polished over 20 in. wide, 26 P square foot
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Plated Copper, 16 P square foot more than Polished
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Spelter—

Western.....	P D 6½¢
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Zinc.

No. 9, base, casks....P D 8½¢ Open.....	P D 8½¢
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Lead.

American Pig.....	P D 5½¢
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Bar.....	P D 6½¢
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Solder.

16 & 18, guaranteed.....	P D 22½¢
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No. 1.....	P D 18½¢
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Refined.....	P D 17½¢
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Prices of Solder indicated by private brand vary according to composition.
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Antimony—

Cookson.....	P D .10¢
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Hallett.....	.10¢
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Other Brands.....	.05¢
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Bismuth—

Per. lb.....	\$2.00
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